

## REFERENCES

- Abel, S.J., E.J. Highwood, J.M. Haywood, and M.A. Stringer, 2005. The direct radiative effect of biomass burning aerosol over southern Africa. *Atmos. Chem. Phys. Discuss.*, 5, 1165–1211.
- Acker, J.G. and Leptoukh, G., 2007. Online analysis enhances use of NASA Earth Science Data. *Transactions of the American Geophysical Union*, 88(2): 14-17.
- Ackerman, A.S., Toon, O.B. Stevens, D.E. Heymsfield, A.J. Ramanathan, V. and Welton. E.J. 2000. Reduction of tropical cloudiness by soot, *Science*, 288, 1042–1047.
- Adamopoulos, A.D., Kambezidis, H.D., Kaskaoutis, D.G., Giavitis, G., 2007. A study of particle size in the atmosphere of Athens, Greece retrieved from solar spectral measurements. *Atmos. Res.* 86, 194-206.
- Akyuz, M., Cabuk, H., 2009. Meteorological variations of PM<sub>2.5</sub>/PM<sub>10</sub> concentrations and particle-associated polycyclic aromatic hydrocarbons in the atmospheric environment of Zonguldak,Turkey. *Journal of Hazardous Materials* 170: 13–21
- Alam, K., Qureshi, S., Blaschke, T., 2011b. Monitoring Spatio-temporal aerosol patterns over Pakistan based on MODIS, TOMS and MISR satellite data and a HYSPLIT model. *Atmos. Environ.*, 45, 4641-4651.
- Alam, K., Trautmann, T., Blaschke, T., 2011a. Aerosol optical properties and radiative forcing over mega-city Karachi. *Atmos. Res.*, 101, 773-782.
- Albrecht, B.A. 1989. Aerosols, cloud microphysics, and fractional cloudiness, *Science*, 245(4923), 1227–1230.
- Alpert, P., Kaufman, Y., Shay-El, Y., Tanrè, D., da Silva, A., Schubert, S., Joseph, J., 1998. Quantification of dust-forced heating of the lower troposphere. *Nature* 395, 367-370.
- Alpert, P., Kishcha, P., Shtivelman, A., Krichak, S.O., Joseph, J.H., 2004. Vertical distribution of Saharan dust based on 2.5-year model predictions. *Atmos. Res.* 70, 109–130.
- Andreae, M.O., 1996. Raising dust in the greenhouse. *Nature* 380, 389–390.
- Antón, M., Loyola, D., Clerbaux, C., López, M., Vilaplana, J. M., Bañón, M., Hadji-Lazaro, J., Valks, P., Hao, N., Zimmer, W., Coheur, P. F., Hurtmans, D., and Alados-Arboledas, L. 2011. Validation of the Metop-A total ozone data from GOME-2 and IASI using reference ground-based measurements at the Iberian Peninsula, *Remote Sens. Environ.*, 115, 1380–1386,
- Ardakani, S.Q., 2006. Determine the air quality in Iran in (2004).Journals of Environmental Science and Technology, Volume 8, Number 4, winter, p. 38-33(In Persian)
- Arnold, E., Merrill, J., Leinen, M., and King, J. 1998. The effect of source area and atmospheric transport on mineral aerosol collected over the north pacific ocean, *Global Planet Change*, 18, 137–159

Asian Development Bank .2005. Establishment of a regional monitoring and early warning network for dust and sandstorms in northeast Asia, volume 2. Asian Development Bank, Manila

Badarinath , K.V.S., Kharol, S.K., Kaskaoutis, D.G. Kambezidis H.D., 2007. Influence of atmospheric aerosols on solar spectral irradiance in an urban area, *J. Atmos. Solar Terr. Phys.*, 69, pp. 589–599

Badarinath, K.V., Kharol, S., Kaskaoutis, D.G., Sharma, A.R., Ramaswamy, V., and Kambezidis, H.D. 2010. Long range transport of dust aerosols over Arabian Sea and Indian region – A case study using satellite data and ground-based measurements, *Global Planet. Change* 72 164–181.

Badarinath, K.V.S., Kharol, S.K., Reddy, R.R., Rama Gopal, K., Narasimhulu, K., Siva Sankara Reddy, L., Raghavendra Kumar, K., 2009. Black carbon aerosol mass concentration variation in urban and rural environments of India - A case study. *Atmospheric Science Letters*, 10, 29-33.

Baddock, M.C., Bullard, J.E., Bryant, R.G., 2009. Dust source identification using MODIS: A comparison of techniques applied to the Lake Eyre Basin, Australia. *Rem. Sens. Environ.* 113, 1511-1528.

Bagnold, R.A. 1941. The physics of blown sand and desert dunes. Methuen, London

Balis, D.S., Amiridis, V., Nickovic, S., Papayannis, A., Zerefos, C.S. 2004. Optical properties of Saharan dust layers as detected by a Raman lidar at Thessaloniki, Greece. *Geophys. Res. Lett.* 31: LI3104, doi:101029/2004GL019881.

Barlow, M., Cullen, H., and Lyon, B., 2002, Drought in central and southwest Asia: La Niña, the warm pool, and Indian Ocean precipitation: *Journal of Climate*, v. 15, p. 697–701.

Barnaba, F., Gobbi, G.P. 2004: Modeling the aerosol extinction versus backscatter relationship for lidar applications: maritime and continental conditions, *J. Atmos. Oc.*, 21, 428–442.,

Bartzokas, A., Kassomenos, P., Petrakis, M., Celessides, C., 2004. The effect of meteorological and pollution parameters on the frequency of hospital admissions for cardiovascular and respiratory problems in Athens. *Indoor and Built Environ.* 13, 271-275.

Bar-Ziv, J., Goldberg, G.M. 1974. Simple siliceous pneumoconiosis in Negev Bedouins. *Arch Environ Health* 29:121–126

Bergametti, G., Gomes, L., Coude-Gaussen, G., Rognon, P., Le Coustumer, M.-N., 1989. African dust observed over Canary islands: Source-regions identification and transport pattern for some summer situations. *J. Geophys. Res.*, 94, D12, 14855-14864.

Berrick, S., Gregory Leptoukh, John Farley, Hualan Rui, 2008. Giovanni: A Web Services Workflow-Based Data Visualization and Analysis System, *IEEE Trans. on Geos. & RS*,

Bhaskaran , k., Wilkinson, p., and smeeth, L. 2011. Cardiovascular consequences of air pollution: what are the mechanisms? *Heart*, 97, 519-520.

- Bilos, C., Colombo, J.C., Skorupka, C.N., Presa, M.J.R., 2001. Sources, distribution and variability of airborne trace metals in La Plata City area, Argentina. Environ. Pollut. 111, 149–158.
- Biscaye, P. E., Grousset, F.E. 1998. Ice-core and deep-sea records of atmospheric dust. In A. Busacca (Ed.), Dust aerosols, loess soils, and global change (pp. 101–103). College Agric. Home Econ. Misc. Publ. MISC0190 (1998). Pullman, WA: Washington State Univ.
- Bollasina, M., Nigam, S., and Lau, K.-M. 2008. Absorbing aerosols and summer monsoon evolution over South Asia: An observational portrayal, J. Climate, 21, 3221–3239.
- Bou Karam, D., Flamant, C., Cuesta, J., Pelon, J and Williams, E., 2010. Dust emission and transport associated with a Saharan depression: February 2007 case. Journal of Geophysical Research, vol. 115, d00h27, doi:10.1029/2009jd012390, 2010
- Brazel, A., Hsu, S. 1981. The climatology of hazardous Arizona dust storms. In: Péwé TL (ed) 1981 Desert dust. Geol Soc Am Spec Pap 186:293–303
- British Geological Survey, <http://bgs.ac.uk/>
- Broecker, W.S., 2000. Abrupt climate change: causal constraints provided by the paleoclimate record. Earth Science Reviews 51, 137–154.
- Brown, J.K.M., Hovmöller, M.S. 2002 Aerial dispersal of pathogens on the global and continental scales and its impact on plant disease. Science 297:537–541
- Bücher, A., 1986. Recherches sur les poussières minérales d'originesaharienne. PhD thesis, Université de Reims-Champagne-Ardenne,France.
- Bullard, J.E., McTainsh, G.H., Pudmenky, C. 2004. Aeolian abrasion and modes of fine particle production from natural red dune sands: an experimental study. Sedimentology 51:1103–1125
- Bullard, J.E., White, K. 2005. Dust production and the release of iron oxides resulting from the Aeolian abrasion of natural dune sands. Earth Surf Process Landforms 30:95–106
- Burritt, B., Hyers, A.D. 1981 Evaluation of Arizona's dust warning system. In: Péwé TL (ed) Desert dust. Geol Soc Am Spec Pap 186:281–292
- Caquineau, S., Magonthier, M.C., Gaudichet , A., Gomes, L. 1997. An improved procedure for the X-ray diffraction analysis of low-mass atmospheric dust samples. Eur. J. Mineral. 9: 157–166.
- Carlson, T. N., and J. M. Prospero, 1972. The Large-Scale Movement of Saharan Air Outbreaks over the Northern Equatorial Atlantic. J. Appl. Meteor., 11(2), 283-297.
- Chakra, O.R.A., Joyeux, M., Nerriere, E., Strub, M.P., Zmirou-Navier, D., 2007. Genotoxicity of organic extracts of urban airborne particulatematter: an assessment within a personal exposure study, Chemosphere 66:1375–1381.
- Chaloulakou, A., Kassomenos, P., Spyrelis, N., Demokritou, P., Koutrakis, P., 2003. Measurements of PM10 and PM2.5 particle concentrations in Athens, Greece. Atmos. Envir. 37, 649-660.

- Charlson, R. J., S. E. Schwartz, J. M. Hales, R. D. Cess, J. A. Coakley, Jr., J. E. Hansen, and D. J. Hofmann, 1992: Climate forcing by anthropogenic aerosols. *Science*, 255, 423–430.
- Charlson, R. J., Schwartz, S. E. Hales, J. M. Cess, R. D. Coakley, J. A. Hansen, J. R. and Hofmann, D. J. 1992. Climate forcing by anthropogenic aerosols, *Science*, 255, 423-430, 1992.
- Chen, Y.S., Sheen, P.C., Chen, E.R., Liu, Y.K., Wu, T.N., Yang, C.Y. 2004. Effects of Asian dust storm events on daily mortality in Taipeh, Taiwan. *Environ Res* 95:151–155
- Cheraghi, M., 2001. Evaluation and comparison of air quality in Tehran and Isfahan in 1999 and offering solutions to improve It, MSc thesis of Environment, Natural Resources Faculty of Tehran University, 150 Pages (In Persian)
- Choi, M. S., & Bang, E. J. 1999. Trace metals in airborne particulate collected at Cheju Island, Korea. *Journal of Korean Society for Atmospheric Environment*, 15, 727–738.
- Chow, J. C., Watson, J. G., Ashbaugh, L. L., Magliano, K. L. 2003. Similarities and differences in PM10 chemical source profiles for geological dust from the San Joaquin Valley, California. *Atmospheric Environment*, 37, 1317–1340.
- Christopher SA, Gupta P, Johnson B, Brindley H, Haywood J, Hsu C. 2011. Multi-sensor satellite remote sensing of dust aerosols over North Africa during GERBILS. *Q. J. R. Meteorol. Soc.* 137: 1168–1178, DOI: 10.1002/qj.863
- Christopher, B.K., John M. O. 2004. Elemental Analysis of Sub-Hourly Ambient Aerosol Collections, *Aerosol Science and Technology* , Volume 38, Issue 3, 205-218
- Christopher, S. A., Zhang , J., 2002. Shortwave aerosol radiative forcing from MODIS and CERES observations over the oceans, *Geophys. Res. Lett.*, 29(18), 1859, doi:10.1029/2002GL014803.
- Chu, D. A., Kaufman, Y. J. Zibordi, G. Chern, J. D. Mao, J. Li, C. and Holben, B. N. 2003: Global monitoring of air pollution over land from EOS- Terra MODIS. *J. Geophys. Res.* 108 (D21), 4661, doi: 10.1029/2002JD003179.
- Claquin, T., Schulz, M., Balkanski, Y., Boucher, O., 1998. Uncertainties in assessing radiative forcing by mineral dust. *Tellus B* 50, 491-505.
- Claquin, T., Schulz, M., Balkanski, Y.J., 1999. Modeling the mineralogy of atmospheric dust sources. *Journal of Geophysical Research-Atmospheres* 104 (D18), 22243–22256.
- Clarke, F. W., 1924. Bull. U.S. geol. Surv., 700, p. 29.
- Clements, T., Stone, R.O., Mann, J.F., Eyman, J.L., 1963. A study of windborne sand and dust in desert areas. U.S. Army, Natick Laboratories Mass., Earth Science Division, Technical Report ES- 8, Project Ref. 7x83-01-008.
- Clough, W.S., 1975. The deposition of particles on moss and grasssurfaces. *Atmospheric Environment* 9, 1113–1119.
- Cogliani, E., 2001. Air pollution forecast in cities by an air pollution index highly correlated with meteorological variables. *Atmospheric Environment*, 35, 2871-2877.

- Cong, Z., Kang, S., Liu, X., Wang, G., 2007. Elemental composition of aerosol in the Nam Co region, Tibetan Plateau, during summer monsoon season. *Atmospheric Environment* 41, 1180–1187.
- Coudé-Gaussen, G. 1984. Le cycle des poussières éoliennes désertiques actuelles et la sedimentation des loess péridesertiques quaternaires. *Bull Cent Rech Explor Prod Elf Aquitaine* 8:167–182
- Coz, E., Gómez-Moreno, F.J., Pujadas, M., Casuccio, G.S., Lersch, T.L. and Artinano, B. 2009. Individual particle characteristics of North African dust under different long-range transport scenarios. *Atmospheric Environment* 43(11):1850-1863.
- Crooks, G.A., Cowan, G.R.C. 1993. Duststorm, South Australia, November 7th, 1988. *Bull Aust Meteorol Oceanogr Soc* 6:68–72
- d'Almeida, G.A., 1987. On the variability of desert aerosol radiative characteristics. *Journal of Geophysical Research* 92, 3017–3026.
- Dalmeida, G.A., 1987. On the variability of desert aerosol radiative characteristics. *Journal of Geophysical Research* 92, 3017–3026.
- Darmenova, K., Sokolik, I. N., Darmenov, A. 2005, Characterization of east Asian dust outbreaks in the spring of 2001 using ground-based and satellite data, *J. Geophys. Res.*, 110, D02204, doi:10.1029/2004JD004842
- De Graaf, M., Stammes, P., Torres, O., Koelemeijer, R.B.A., 2005. Absorbing Aerosol Index: Sensitivity Analysis, application to GOME and comparison with TOMS. *J. Geophys. Res.* 110, D01201, doi: 10.1029/2004JD005178.
- Deer, W. A., Howie, R. A. and Zussman, J. 1966. *An Introduction to the Rock Forming Minerals*, Longmans, pp. 528.
- Dentener, F.J., Carmichael, G.R., Zhang, Y., Lelieveld, J., Crutzen P.J. 1996, Role of mineral aerosol as a reactive surface in the global troposphere, *Journal of Geophysical Research-Atmospheres*, 101 (D17) pp. 22869–22889
- Derbyshire, E. 2001. Geological hazards in loess terrain, with particular reference to the loess regions of China. *Earth Sci Rev* 54:231–260
- Dey, S., and di Girolamo, L., 2010. A climatology of aerosol optical and microphysical properties over the Indian subcontinent from 9 years (2000-2008) of Multiangle Imaging Spectroradiometer (MISR) data. *J. Geophys. Res.*, 115, D15204, doi:10.1029/2009JD013395.
- Dey, S., and Di Girolamo, L., 2011 A decade of change in aerosol properties over the Indian subcontinent *Geophys. Res. Lett.* 38 L14811
- Dey, S., Tripathi, S. N., Singh, R. P., and Holben, B. N. 2004: Influence of dust storms on the aerosol optical properties over the Indo-Gangetic Basin, *J. Geophys. Res.*, 109, D20, 211, doi:10.1029/2004JD004924., 2870
- Di Sarra, A., Cacciani, M., Chamard, P., Cornwall, C., DeLuisi, J. J., Di Iorio, T., Disterhoft, P., Fiocco, G., Fuà, D., and Monteleone, F. 2002. Effects of desert dust and ozone on the ultraviolet irradiance the Mediterranean island of Lampedusa during PAUR II, *J. Geophys.*
- Di Sarra, A., M. Caccian, M. Campanelli, P. Chamard, C. Cornwal, J. Deluici, L. De Silverteri, T., Di Iorio, P. DISTERHOFT, G. FIOCCO, D. FUÀ, P. Grigioni, W.

- Junkermann, F. Marenco, D. Meloni, F. Monteleone and B. Olivier, B., 2001. Radiation, ozone, and aerosol measurements at Lampedusa during the PAUR II Campaign, in IRS 2000: Current Problems in Atmospheric Radiation, edited by W.L. Smith and YU. M. Timofeyev (A. Deepak Publishing, Hampton, Virginia), 1193-1196.
- Dickerson, R.R., Kondragunta, S., Stenchikov, G., Civerolo, K.L., Doddridge, B.G., Holben, B.N. 1997. The impact of aerosols on solar ultraviolet radiation and photochemical smog. *Science* 278, 827-830.
- Diner, D. J., T. P. Ackerman, A. J. Braverman, C. J. Bruegge, M. J. Chopping, E. E. Clothiaux, R. Davies, L. Di Girolamo, R. A. Kahn, Y. Knyazikhin, Y. Liu, R. Marchand, J. V. Martonchik, J-P. Muller, A. W. Nolin, B. Pinty, M. M. Verstraete, D. L. Wu, M. J. Garay, O. V. Kalashnikova, A. B. Davis, E. S. Davis, R. A. Chipman, 2010. Ten years of MISR observations from TERRA: Looking back, ahead and in between, Proceedings of the 2010 IEEE International Geoscience and Remote Sensing Symposium, Honolulu, HI, 2010.
- Diner, D.J., Beckert, J.C., Reilly, T. HBruegge, C.J., Conel, J.E., Kahn, R.A., Martonchik, J., VAckerman, T.P., Davies, R., Gerstl, S.A.W., Gordon, H.R., Muller, J.-P., Myneni, R.B., Sellers, P.J., Pinty, B., Verstraete, M.M. 1998. Multi-angle imaging spectroradiometer (MISR) instrument description and experiment overview. *IEEE Trans. Geosci. Rem. Sens.* 36, 1072-1087, 1998
- Dockery D, Pope A. Epidemiology of acute health effects: summary of time-series studies. In: Particles in Our Air: Concentrations and Health Effects (Wilson R, SpenglerJD, eds). Cambridge, MA:Harvard University Press, 1996,123-147.
- Dockery, D., Pope, C.A., Xiping, X., Spengler, J., Ware, J., Fay, M., Ferris, B., Spiezer, F., 1993. An association between air pollution and mortality in six US cities. *New England Journal of Medicine* 329 (24), 1753–1759.
- Dong, Z., Man, D., Luo, W., Qian, Q., Wang, J., Zhao, M., Liu, Sh., Zhu, G., Zhu, Sh. 2010. Horizontal aeolian sediment flux in the Minqin area, a major source of Chinese dust storms, *Geomorphology* 116 58–66
- Dunion, J., Velden, C., 2004. The impact of the Saharan air layer on Atlantic tropical cyclone activity. *Bull. Amer. Meteor. Soc.* 85, 353-365.
- Ekhtesasi, M.R., 2009. National project of monitoring of wind erosion and sand storm in Iran, forests and range and watershed organization of Iran (Persian language)
- Ekhtesasi, M.R., Daneshvar, M.R., Abolghasemi, M., Feiznia, S., and Saremi Naeini, M.A. Measurement and Mapping of Aeolian Sand Flowthrough Sediment Trap Method (Case Study: Yazd-Ardakan Plain), *Journal of the Iranian Natural Res.*, Vol. 59, No. 4, 2007, pp. 773-781
- El-Askary, H., Gautam, R., Singh, R.P., Kafatos, M , 2006. Dust storms detection over the Indo-Gangetic basin using multi sensor data. *Adv Space Res*, Volume 37, Issue 4, 728–733
- Engelbrecht, J.P., McDonald, E.V., Gillies, J.A., Jayanty RKM, Casuccio, G., Gertler, A.W. 2009, Characterizing mineral dusts and other aerosols from the Middle East—Part 1: Ambient sampling. *Inhalation Toxicology* 21:297 -326

- Engelstaedter, S., Tegen, I., Washington, R., 2006. North African dust emissions and transport. *Earth-Science Reviews* 79, 73-100.
- Environmental Protection Agency (EPA), 1999. Guideline for reporting the daily air quality-air quality index (AQI). EPA-1999-454/R-99-010.
- Erel,Y., Dayan,U., Rabi, R., Rudich,Y., Stein,M., 2006. Trans boundary transport of pollutants by atmospheric mineral dust. *Environmental Science & Technology* 40 (9), 2996–3005.
- Esmaili, O and Tajrishy, M, 2006, Results of the 50 year ground-based measurements in comparison with satellite remote sensing of two prominent dust emission sources located in Iran, Proc. SPIE 6362, 636209, <http://dx.doi.org/10.1117/12.692989>
- Fahey, B. 1985. Salt weathering as a mechanism of rock breakup in cold climates: an experimental approach. *Zeitschr Geomorphol* 29:99–111
- Falkowski, P.G., Barber, R.T., Smetacek, V. 1998. Biogeochemical controls and feedbacks on ocean, primary production. *Science* 281, 200-206.
- Folk, R.L. 1975. Geological urban hindplanning, an example from a Hellenistic Byzantine city, Stobi, Jugoslavian Macedonia. *Environ Geol* 1:5–22
- Frank, J.D., Gregory, R.C., Yang, Z., et al., 1996. Role of mineral aerosol as a reactive surface in the global troposphere. *Journal of Geophysical Research* 101 (D17), 22,869–22,889.
- Franzen, L.G., Mattson, J.O., Martensson, U. 1994. Yellow snow over the Alps and sub-Arctic from dust storm in Africa, March 1991. *Ambio* 23, 233-235.
- Fung, I.Y., Meyn, S.K., Tegen, I., Doney, S.C., John, J.G., Bishop, J.K.B. 2000. Iron supply and demand in the upper ocean. *Global Biogeochemical Cycles* 14, 281-295.
- Gabriel, A.P., Martínez-Ordaz, V.A., Velasco-Rodreguez, V.M., Lazo-Sáenz, J.G., Cicero, R 1999. Prevalence of skin reactivity to coccidioidin and associated risks factors in subjects living in a northern city of Mexico. *Arch Med Res* 30:388392
- Ganji, M.H., 1968, The climate of Iran, in Fisher, W.B., ed., *The land of Iran—The Cambridge history of Iran*, I: Cambridge, University Press, p. 212–245.
- Ganor, E., 1975. Atmospheric dust in Israel. *Sedimentological and Meteorological Analysis of Dust Deposition*. PhD thesis, Hebrew University of Jerusalem, Israel.
- Ganor, E., Foner, H.A., & Gravenshorst, G. 2003. The amount and nature of the dust on Lake Kinneret (the Sea of Galilee), Israel: flux and fractionation. *Atmospheric Environment*, 37, 4301–4315.
- Gao, X. J., Zhao, Z. C. and Giorgi, F. 2002, Changes of extreme events in regional climate simulations over East Asia, *Adv. Atmos. Sci.*, 19(5), 927– 942.
- Garrison V.H., E.A. Shinn, W.T. Foreman, D.W. Griffin, C.W. Holmes, C.A. Kellogg, M.S. Majewski, L.L. Richardson, K.B. Ritchie, and G.W. Smith. 2003. African and Asian dust: From desert soils to coral reefs. *BioScience* 53: 469-480.
- Gautam, R., Hsu, N. C., and Lau, K.-M. 2010. Premonsoon aerosol characterization and radiative effects over the Indo-Gangetic Plains: Implications for regional climate warming, *J. Geophys. Res.*, 115, D17208, doi:10.1029/2010JD013819.

- Gautam, R., Liu, Z., Singh, R. P., Hsu, N.C., 2009. Two contrasting dust-dominant periods over India observed from MODIS and CALIPSO data. *Geophys. Res. Lett.*, 36, L06813, doi:10.1029/2008GL036967.
- Gautam, R., Hsu, N. C., Tsay, S. C., Lau, K. M., Holben, B., Bell, S. 2011 Accumulation of aerosols over the Indo-Gangetic plains and southern slopes of the Himalayas: distribution, properties and radiative effects during the 2009 pre-monsoon season *Atmos. Chem. Phys.* 11 12841–63
- Generoso, S., I. Bey, M. Labonne, 2008, Aerosol vertical distribution in dust outflow over the Atlantic: Comparisons between GEOS-Chem and Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation (CALIPSO), *J. Geophys. Res.*, 113, D24209, doi:10.1029/2008JD010154.
- Giles, J. 2005. The dustiest place on Earth. *Nature* 434:816–819
- Ginoux, P., Chin, M., Tegen, I., Prospero, J., Holben, B.N., Dubovik, O., Lin, S.J. 2001. Sources and distributions of dust aerosols simulated with the GOCART model. *J. Geophys. Res.* 106, 20255–20273.
- Gobbi, G.P., Barnaba, F., Ammannato, L., 2007. Estimating the impact of Saharan dust on the year 2001 PM10 record of Rome, Italy. *Atmos. Environ.* 41, 261–275.
- Godoy, L., Godoy, J. L. A., Roldão, L., 2009. Coarse and fine aerosol source apportionment in Rio de Janeiro, Brazil, *Atmospheric Environment Volume* 43, Issue 14, May 2009, Pages 2366-2374
- Goldsmid, S., 1876, Eastern Persia: London, Macmillan and Co., 2 volumes.
- Goodman, G.T., Inskip, M.J., Smith, S., Parry, G.D.R., Burton, M.A. S., 1979. The use of moss-bags in aerosol monitoring. In: Morales, C. (Ed.), *Saharan Dust. Mobilization, Transport, Deposition*. Wiley, New York, pp. 211–232.
- Goossens, D., 2005. Quantification of the dry aeolian deposition of dust on horizontal surfaces: an experimental comparison of theory and measurements. *Sedimentology* 52:859–873
- Goossens, D., Offer, Z.Y., 1990. A wind tunnel simulation and field verification of desert dust deposition (Avdat Experimental Station, Negev Desert). *Sedimentology* 37, 7–22.
- Goossens, D., Offer, Z.Y., 1993. Eolian deposition of dust over symmetrical hills: an evaluation of wind tunnel data by means of terrain measurements. *Zeitschrift für Geomorphologie* 37, 103–111.
- Goossens, D., Offer, Z.Y., 1994. An evaluation of the efficiency of some eolian dust collectors. *Soil Technology* 7 (1), 25–35.
- Goudie , A.S., Day, M.J. 1980. Dinsintegration of fan sediments in Death Valley, California, by salt weathering. *Phys Geogr* 1:126–137
- Goudie, A.S., Cooke, R.U., Doornkamp, J.C .1979. The formulation of silt from quartz dune sand by salt weathering processes in deserts. *J Arid Environ* 2:105–112
- Goudie, A. S., and Middleton.N.J., 2001. Saharan dust storms: nature and consequences. *Earth-Science Reviews* 56: 179–204.

- Goudie, A.S., 1983. Dust storms in space and time. *Progress in Physical Geography* 7, 502-530.
- Goudie, A.S., Middleton, N.J., 1992. The changing frequency of dust storms through time. *Climate Change* 20, 197-223.
- Goudie, A.S., Middleton, N.J., 2000. Dust storms in south west Asia. *Acta Universitatis Carolinae, Supplement* 73-83.
- Goudie, A.S., Middleton, N.J., 2006. *Desert dust in the global system*, Springer. 2006.
- Goudie, A.S., Stokes, S., Livingstone, I., Bailiff, I.K., Allison, R.J. 1993. Post-depositional modification of the linear sand ridges of the West Kimberley area of north-west Australia. *Geogr J* 159:306–317
- Goudie, A.S., Viles, H. 1995. The nature and pattern of debris liberation by salt weathering: a laboratory study. *Earth Surf. Processes Landforms* 20, 437-449
- Griffin, D.W., Garrison, V.H., Herman, J.R., Shinn, E.A. 2001. African desert dust in the Caribbean atmosphere: microbiology and public health. *Aerobiologia* 17:203–213
- Griffin, D.W., Kellogg, C. A., Garrison, V. H., Lisle, J. T., Borden, T. C., Shinn, E. A. 2003. Atmospheric microbiology in the northern Caribbean during African dust events. *Aerobiologia* 19, 143–157.
- Gromet, L. P., Dymek, R.F., Haskin, L.A., and Korotev, R.L. 1984. The "North American shale composite": Its compilation, major and trace element characteristics. *G. eochimica et Cosmochimica Acta*, 48,2469- 2482
- Guan, H., Esswein, R., Lopez, J., Bergstrom, R., Warnock, A., Follette-Cook, M., Fromm, M., Iraci, L., 2010. A multi-decadal history of biomass burning plume heights identified using aerosol index measurements. *Atmospheric Chemistry and Physics Discussion* 10, 1e25.
- Gyan, K., Henry, W., Lacaille, S., Laloo, A., Lamsee-Ebanks, C., McKay, S., Antoine, R.M., Monteil, M.A. 2005. African dust clouds are associated with increased paediatric asthma accident and emergency admissions on the Caribbean island of Trinidad. *Int J Biometeorol* 49:371–376
- Hall, D.J., Upton, S.L., 1988. A wind tunnel study of the particle collection efficiency of an inverted frisbee used as a dust collector. *Atmospheric Environment* 22, 1383–1394.
- Hall, D.J., Waters, R.A., 1986. An improved, readily available dust gauge. *Atmospheric Environment* 20, 219–222.
- Han, J. S., Moon, K. J., Ryu, S. Y., Kim, Y. J., & Perry, D. 2005. Source estimation of anthropogenic aerosols collected by a DRUM sampler during spring of 2002 at Gosan, Korea. *Atmospheric Environment*, 39, 3113–3125. doi:10.1016/j.atmosenv.2005.01.047.
- Haywood, J. M., Ramaswamy, V. and Soden, B. J. 1999. Tropospheric aerosol climate forcing in clear-sky satellite observations over the oceans, *Science*, 283, 1299–1305.,
- Haywood, J.M. and Boucher, O., 2000: Estimates of the direct and indirect radiative forcing due to tropospheric aerosols: a review. *Revs. Geophys.*, 38, 513-543.

- Haywood, J.M., Johnson, B.T., Osborne, S.R., Baran, A.J., Brooks, M., Milton, S.F., Mulcahy, J., Walters, D., Allan, R.P., Klaver, A., Formenti, P., Brindley, H.E., Christopher, S., Gupta, P. 2011. Motivation, rationale and key results from the GERBILS Saharan dust measurement campaign. *Q. J. R. Meteorol. Soc.* 137: 1106–1116. DOI:10.1002/qj.797
- Herman, B.M., Celarier, E. 1997. Earth surface climatology at 340 nm and 380 nm from TOMS data. *J. Geophys. Res.* 102, 12059-12076.
- Hess, A. M., Koepke, P., and Schult, I., 1998. Optical properties of aerosol and clouds: the software package OPAC, *Bull. Am. Meteorol. Soc.*, 79, 831-844.
- Hobbs, P.V. 1993. *Aerosol-Cloud-Climate Interactions*. San Diego, Academic Press
- Hoseini, S. M., Ekhtesasi, M.R., Bazi, KH. R., 2010. Study of types and intensity of effective factors in desertification of the Sistan ( Case study Natak region), *Iranian journal of Geographic Space*, 10(31):119-136.
- Hsu, N. C., Tsay, S.-C., King, M. D., and Herman, J. R. 2004: Aerosol properties over bright-reflecting source regions, *IEEE Trans. Geosci. Remote Sens.*, 42, 557–569.,
- Hsu, N. C., Tsay, S.-C., King, M. D., and Herman, J. R. 2006: Deep Blue retrievals of Asian aerosol properties during ACE-Asia, *IEEE Trans. Geosci. Remote Sens.*, 44, 3180–3195.
- Hsu, N.C., Herman, J.R., Torres, O., Holben, B.N., Tanre, D., Eck., T.F., Smirnov, A., Chatenet, B., Lavenu, F., 1999. Comparisons of the TOMS aerosol index with sun photometer aerosol optical thickness: results and applications. *J. Geophys. Res.* 104, 6269-6279.
- Husar, R.B., Prospero, J.M., Stowe, L.L., 1997. Characterization of tropospheric aerosols over the oceans with the NOAA advanced very high resolution radiometer optical thickness operational product. *Journal of Geophysical Research* 102, 16,889–16,909.
- Hussain A, Mir H, Afzal M , 2005. Analysis of dust storms frequency over Pakistan during 1961–2000. *Pak J Meteorol* 2:49–68
- Immerzeel, W.W., Droogers, P., de Jong, S. M., and Bierkens, M. F.P. 2009. Large-scale monitoring of snow cover and runoff simulation in Himalayan river basins using remote sensing, *Remote Sens. Environ.*, 113, 40–49, doi:10.1016/j.rse.2008.08.010.,
- IPCC, (Intergovernmental Panel on Climate Change), 2001. *Climate Change 2001: The Scientific Basis*. In Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate. J.T. Houghton et al., Eds, Cambridge Univ. Press, New York, USA.
- IPCC, 2007. *Climate Change 2007: Synthesis Report*. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. In: Core Writing Team, Pachauri, R.K., Reisinger, A. (Eds.), Geneva, Switzerland, p. 104.
- Israelevich, P.L., Levin, Z., Joseph, J.H., Ganor, E. 2002. Desert aerosol transport in the Mediterranean region as inferred from the TOMS aerosol index. *J. Geophys. Res.* 107, D21, doi:10.1029/2001JD002011.

- Jadidoleslami, M., Rahanama Rad, J., Basirani N., 2011. The origin of Aeolian sediments in the Chahnameh of Zabol. *Appl. Geology*, 7(1), 9-16.
- Jalaludin, B.B., O'Toole, B.I., Leeder, S.R., 2004. Acute effects of urban ambient air pollution on respiratory symptoms, asthma medication use, and doctor visits for asthma in a cohort of Australian children. *Environmental Research*, 95, 32-42.
- Janssen, W. and Tetzlaff, G., 1991. Entwicklung und Eichung einer registrierenden Suspensionsfalle. *Zeitschrift für Kulturtechnik und Landesentwicklung* 32, 167–180.
- Jones, P., Charlson, R., Rodhe, H., 1995. In: Houghton, J.T., et al. (Eds.), *Aerosols in Climate Change 1994*. Cambridge University Press, New York
- Kahn, R. A., Gaitley, B. J., Garay, M. J., Diner, D. J., Eck, T. F., Smirnov, A., and Holben, B. N., 2010. Multiangle Imaging SpectroRadiometer global aerosol product assessment by comparison with the Aerosol Robotic Network. *J. Geophys. Res.*, 115, D23209, doi:10.1029/2010JD014601.
- Kahn, R., B. Gaitley, J. Martonchik, D. Diner, K. Crean, and B. Holben, 2005. MISR global aerosol optical depth validation based on two years of coincident AERONET observations. *J. Geophys. Res.*, doi:10:1029/2004JD004706.
- Kahn, R., Petzold, A., Wendisch, M., Bierwirth, E., Dinter, T., Esselborn, M., Fiebig, M., Heese, B., Knippertz, P., Muller, D., Schladitz, A., Von Hoyningen-Huene, W., 2009. Desert dust aerosol air mass mapping in the western Sahara, using particle properties derived from space-based multi-angle imaging. *TellusB*, 61, 239-251.
- Kalashnikova O. V. and I. N. Sokolik , 2002. Importance of shapes and compositions of wind-blown dust particles for remote sensing at solar wavelengths, *GRL*, 29, N. 10, 10.1029/2002GL014947
- Kalashnikova, O. V., R. Kahn, I. N. Sokolik, and W.-H. Li 2005, Ability of multiangle remote sensing observations to identify and distinguish mineral dust types: Part 1. Optical models and retrievals of optically thick plumes, *J. Geophys. Res.*, 110, D18S14, doi:10.1029/2004JD004550
- Kalashnikova, O.V., and Kahn, R.A., 2008. Mineral dust plume evolution over the Atlantic from MISR and MODIS aerosol retrievals. *J. Geophys. Res.*, 113, D24204, doi:10.1029/2008JD010083.
- Kambezidis H.D., Katevatis E.M., Petrakis M., Lykoudis S. and Asimakopoulos D.N. (1998) Estimation of the Linke and Unsworth-Monteith turbidity factors in the visible spectrum: application for Athens, Greece. *Solar Energy* 62 (1), 39-50.
- Kandler, K., Schütz, L., Deutscher, C., Ebert, M., Hofmann, H., Jäckel, S., Jaenicke, R., Knippertz, P., Lieke, K., Massling, A., Petzold, A., Schladitz, A., Weinzierl, B., Wiedensohler, A., Zorn, S., Weinbruch, S. 2009. Size distribution, mass concentration, chemical and mineralogical composition and derived optical parameters of the boundary layer aerosol at Tinfou, Morocco, during SAMUM 2006. *TellusB*, 61, 32–50.
- Kaskaoutis, D. G., Gautam, R., Singh, P., Houssos, E., Goto, D., Singh, S., Bartzokas, A., Kosmopoulos, P.G., Sharma, M., Hsu, N., Holben, B.N. 2012 Influence of anomalous dry conditions on aerosols over India: transport, distribution and properties *J. Geophys. Res.* at press (doi:10.1029/2011JD017314)

- Kaskaoutis, D. G., Kambezidis, H. D., Nastos, P. T., and Kosmopoulos, P. G., 2008. Study on an intense dust storm over Greece. *Atmospheric Environment*, 42, 6884-6896.
- Kaskaoutis, D. G., Kharol, S. K., Sinha, P. R., Singh, R. P., Badarinath, K. V. S., Mehdi, W., and Sharma, M., 2011. Contrasting aerosol trends over South Asia during the last decade based on MODIS observations *Atmos. Meas. Tech. Discuss.* 4 5275–323
- Kaskaoutis, D.G., Kambezidis, H.D., Badarinath, K.V.S., Kumar Kharol, S., 2010. Dust storm identification via satellite remote sensing, ISBN: 978-1-60876-906-3,
- Kaskaoutis, D.G., 2008. A study on the optical properties and on the type of aerosols over various land uses, by using satellite and AERONET data, PhD Thesis, University of Ioannina, Greece 2008
- Kaskaoutis, D.G., Kalapureddy, M.C.R., Krishna Moorthy, K., Devara, P.C.S., Nastos, P.T., Kosmopoulos, P.G., Kambezidis, H.D., 2010b. Heterogeneity in pre-monsoon aerosol types over the Arabian Sea deduced from shipboard measurements of spectral AODs. *Atmos. Chem. Phys.* 10, 4893-4908.
- Kaskaoutis, D.G., Kambezidis, H.D., Badarinath, K.V.S., Kumar Kharol, S., 2010a. Dust storm identification via satellite remote sensing. In: *Dust Storms: Elemental Composition, Causes and Environmental Impacts*. Eds: Siniša Brstilo and Quentin Madunic, Nova Science Publishers, ISBN-13: 978-1608769063, pp. 1-59.
- Kaskaoutis, D.G., Nastos, P.T., Kosmopoulos, P.G., Kambezidis, H.D., Kumar Kharol, S., Badarinath, K.V.S., 2010c. The Aura-OMI Aerosol Index distribution over Greece. *Atmos. Res.* 98, 28-39.
- Kaufman, Y. J., D. Tanre, and O. Boucher ,2002. A satellite view of aerosols in the climate system, *Nature*, 419, 215– 223.
- Kaufman, Y. J., Tanre', D. Remer, L. Vermote, E. F. Chu, A. and Holben B. N., 1997, Operational remote sensing of tropospheric aerosol over the land from EOS-MODIS, *J. Geophys. Res.*, 102, 17,051– 17,068.
- Kellogg CA, Griffin DW, Garrison VH, Peak HK, Royall N, Smith RM, Shinn EA (2004) Characterization of aerosolized bacteria and fungi from desert dust events in Mali, West Africa. *Aerobiologia* 20:99–110
- Kendrew, W.G., 1961, The climate of the continents: New York, Oxford University Press, 5th ed., 608 p.
- Kharol, S. K., Badarinath, K. V. S., Sharma, A. R., Kaskaoutis, D. G., and Kambezidis, H. D. 2011. Multiyear analysis of Terra/Aqua MODIS aerosol optical depth and ground observations over tropical urban region of Hyderabad, India, *Atmos. Environ.*, 45, 1532–1542.,
- Kidwell, C. B. and Ondov, J. M. 2001. Development and Evaluation of a Prototype System for Collecting Sub-Hourly Ambient Aerosol for Chemical Analysis. *Aerosol Sci. Technol.*, 35: 596–6
- Kim, D., Chin, M., Yu, H., Eck, T.F., Sinyuk, A., Smirnov, A., Holben, B.N., 2011. Dust optical properties over North Africa and Arabian Peninsula derived from the AERONET dataset. *Atmos. Chem. Phys. Discuss.* 11, 20181–20201.

- Kim, S. B., Yumimoto, K., Uno, I., and Chun, Y. 2011: Dust model intercomparison between ADAM and CFORS/Dust for Asian dust case in 2007 (March 28 – April 3), SOLA, 7A, 025–028,
- Kinne, S., Pueschel, R., 2001. Aerosol radiative forcing for Asian continental outflow. *Atmos. Environ.* 35, 5019–5028.
- Kirkland, T.M., Fierer, J., (1996) Coccidioidomycosis: a reemerging infectious disease. *Emerg Infect Dis* 2:192–199
- Kiss, P., Janosi, I. M., and Torres, O. 2007: Early calibration problems detected in TOMS Earth-Probe aerosol signal, *Geophys. Res. Lett.*, 34, L07803, doi:10.1029/2006GL028108.,
- Knippertz, P., Ansmann, A., Althausen, D., et al., 2009. Dust mobilization and transport in the northern Sahara during SAMUM 2006 - A meteorological overview. *Tellus B* 61, 12-31.
- Kohfeld, K., E., Le Que'ré C., Harrison, S. P., and Anderson R. F. 2005. Role of marine biology in glacial-interglacial CO<sub>2</sub> cycles. *Science* 308, 74–78.
- Kohfeld, K.E., Harrison, S.P. 2001. DIRTMAP: The geological record of dust. *Earth-Science Reviews* 54, 81-114.
- Köhler, A., Fleck, U.W., 1963. Untersuchungen zur Festlegung eines Standardmessgerätes für Staubniederschlag. *Inst. Meteorol. Abschlussber.* No. J., vol. 84, p. 2.
- Koren, I., Kaufman, Y. J., Remer, L. A., and Martins, J. V., 2004, Measurement of the effect of Amazon smoke on inhibition of cloud formation *Science* 303 1342–5
- Koren, I., Y. J. Kaufman, R. Washington, M. C. Todd, Y. Rudich, J. V. Martins, and D. Rosenfeld 2006, The Bodele depression: a single spot in the Sahara that provides most of the mineral dust to the Amazon forest, *Environmental Research Letters*, 1(1).
- Kosmopoulos, P.G., Kaskaoutis, D.G., Nastos, P.T., Kambezidis, H.D., 2008. Seasonal variation of columnar aerosol optical properties over Athens, Greece, based on MODIS data. *Remote Sensing of Environment* 112, 2354e2366.
- Kreutz, K. and Sholkovitz, E. 2000. Major element, rare earth element, and sulfur isotopic composition of a high-elevation firn core: Sources and transport of mineral dust in central Asia. *Geochemistry, Geophysics, Geosystems* 1(11).1525-2027.
- Krueger, B.J., Grassian, V.H., Cowin, J.P., Laskin, A., 2005. Heterogeneous chemistry of individual mineral dust particles from different dust source regions: the importance of particle mineralogy. *Atmospheric Environment* 39 (2), 395-395.
- Kuenen PH (1960) Experimental abrasion 4: eolian action. *J Geol* 68:427–449
- Kulmala M. 2003. How particles nucleate and grow. *Science*, 302, 1000-1001
- Kulmala M., Pirjola L., and Mäkelä J. M, 2000. Stable sulphate clusters as a source of new atmospheric
- Kwaasi AAA, Parhar RS, Al-Mohanna FAA (1998) Aeroallergens and viable microbes in sandstorm dust – potential triggers of allergic and non-allergic respiratory ailments. *Allergy* 53:255–265

- Kwon HJ, Cho SH, ChunY, Lagarde F, Pershagen G (2002) Effects of the Asian dust events on daily mortality in Seoul, Korea. Environ Res 90:1–5
- Larissi, I.K., Antoniou, A., Nastos, P.T., Paliatsos, A.G., 2010a. The role of wind in the configuration of the ambient air quality in Athens, Greece. Fres. Environ. Bull. 19, 1989–1996.
- Larissi, I.K., Koukouletsos, K.V., Moustiris, K.P., Antoniou, A., Paliatsos, A.G., 2010b. PM10 concentration levels in the greater Athens area, Greece. Fresen Environ Bull. 19:226–231
- Larney, F. J., Leys, J. F., Muller, J. F., & McTainsh, G. H. 1999. Dust and endosulfan deposition in cotton-growing area of Northern New South Wales, Australia. Journal of Environmental Quality, 28, 692–701.
- Larsen, T., Carmichael, G.R., 2000. Acid rain and acidification in China: the importance of base cation deposition. Environmental Pollution 110 (1), 89–102.
- Lashkaripour, G.R. and Soloki, H.R. (2003) Study of Dispersive Soils in Sistan Plain in the East of Iran, Proceeding of 12th Asian Regional Conference, Singapore.
- Lawrence, C.R. and Neff, J.C. 2009. The contemporary physical and chemical flux of aeolian dust: A synthesis of direct measurements of dust deposition. Chemical Geology 267: 46–63.
- Lawrence, M.G., Lelieveld, J., 2010. Atmospheric pollutant outflow from southern Asia: a review. Atmospheric Chemistry and Physics 10, 11017e11096
- Leathers, C.R., 1981. Plant components of desert dust in Arizona and their significance
- Lee, K. H., Hu, C. G. 1995.. A study on chemical composition of dustfall sampled in Cheju area: 2. Identification of source. Journal of Korean Society for Atmospheric Environment, 15, 101–111.
- Legrand, M., Plana-Fattori, A., N'Doume, C. 2001. Satellite detection of dust using the IR imagery of Meteosat, 1. Infrared difference dust index. J. Geophys. Res. 106 (D16), 18251–18274.
- Lemaître, C., Flamant, C., Cuesta, J., Raut, J-C., Chazette, P., Formenti, P., Pelon, J. 2010. Radiative heating rates profiles associated with a springtime case of Bodélé and Sudan dust transport over West Africa. Atmos Chem Phys 10:8131–8150. doi:10.5194/acp-10- 8131
- Lenes, J. M., Darrow, B. P., Cattrall, C., Heil, C. A., Callahan, M., Vargo, G. A., Byrne, R. H., Prospero, J.M., Bates, D.E., Fanning, K.A., Walsh, J. J. 2001. Iron fertilization and the *Trichodesmium* response on the West Florida shelf. Limnology and Oceanography 46 (6), 1261–1277.
- Leon JF, LeGrand M , 2003. Mineral dust sources in the surroundings of the North Indian Ocean. Geophys Res Lett 30:1309
- Levin, Z. and Cotton, W. 2009: Aerosol Pollution impact on Precipitation: A Scientific Review. Springer, Netherlands, ISBN 140208689X.
- Levin, Z., Ganor, E., Gladstein, V. 1996. The effects of desert particles coated with sulphate on rain formation in the eastern Mediterranean. J. Appl. Meteorol. 35, 1511–1523.

- Levy, R. C., Remer, L. A., Kleidman, R. G., Mattoo, S., Ichoku, C., Kahn, R., and Eck, T. F. 2010. Global evaluation of the Collection 5 MODIS dark-target aerosol products over land, *Atmos. Chem. Phys.*, 10, 10399–10420, doi:10.5194/acp-10-10399-2010,
- Levy, R.C., Remer, L.A., Dubovik, O. 2007. Global aerosol optical properties and application to Moderate Resolution Imaging spectroradiometer aerosol retrieval over land. *J. Geophys. Res.* 112, D13210, doi:10.1029/2006JD007815
- Levy, R.C., Remer, L.A., Tanre, D., Kaufman, Y.J., Ichoku, C., Holben, B., Livingston, J., Russell, P., Mating, H. 2003. Evaluation of the MODIS retrievals of dust aerosol over the ocean during PRIDE. *J. Geophys. Res.* 108, doi:10.1029/2002JD002460.
- Lioy, P. J., Freeman, N. C. G., & Millette, J. R. 2002. Dust: A metric for use in residential and building exposure assessment and source characterization. *Environmental Health Perspectives*, 110, 969–983.
- Littmann, T., 1997. Atmospheric input of dust and nitrogen into the Nizzana sand dune ecosystem, north-western Negev, Israel. *Journal of Arid Environments* 36, 433–457.
- Liu, Y., Franklin, M., Kahn, R., Koutrakis, P., 2007. Using aerosol optical thickness to predict ground-level PM concentrations in the St. Louis area: a comparison between MISR and MODIS. *Remote Sensing of Environment* 107, 33e44.
- Liu, Z. Liu, D. Huang, J. 2008a: Airborne dust distributions over the Tibetan Plateau and surrounding areas derived from the first year of CALIPSO lidar observations. *Atmos. Chem. Phys. Discuss.*, 8, 5957–5977.
- Liu, Z. Liu, D. Huang, J. 2008b: CALIPSO lidar observations of the optical properties of Saharan dust: A case study of long-range transport. *J. Geophys. Res.*, 113, D07207, doi:10.1029/2007JD008878
- Lohmann, U. and Feichter, J. 2005. Global Indirect Aerosols Effects: A Review. *Atmos. Chem. Phys.* 5: 715–737.
- Madhavan, B.L., Niranjan, K., Sreekanth, V., Sarin, M.M., Sudheer, A.K., 2008. Aerosol characterization during the summer monsoon period over a tropical coastal Indian station, Visakhapatnam. *J. Geophys. Res.* 113, D21208, doi:10.1029/2008JD010272.
- Maghrabi, A., Alharbi, B., Tapper, N., 2011. Impact of the March 2009 dust event in Saudi Arabia on aerosol optical properties, meteorological parameters, sky temperature and emissivity. *Atmos. Environ.* 45, 2164–2173.
- Mahowald, N., Baker, A., Bergametti, G., Brooks, N., Duce, R., Jickells, T., Kubilay, N., Prospero, J., Tegen, I., 2005. Atmospheric global dust cycle and iron inputs to the ocean. *Global Biogeochem. Cycles* 19, GB4025, doi: 10.1029/2004GB002402.
- Manoli, E., Voutsas, D., Samara, C., 2002. Chemical characterization and source identification apportionment of fine and coarse air particles in Thessaloniki, Greece. *Atmos. Environ.* 36, 949–961.
- Marey, H. S. , Gille, J. C. El-Askary, H. M., Shalaby E. A., and El-Raey M. E.2011, Aerosol climatology over Nile Delta based on MODIS, MISR and OMI satellite data, *Atmos. Chem. Phys.*, 11, 10637–10648
- Masmoudi M, Chaabane M, Medhioub K, Elleuch F., 2003. Variability of aerosol optical thickness and atmospheric turbidity in Tunisia. *Atmos Res* 66:175–188

- McCauley, J.F., Grolier, M.J., and Breed, C.S., 1977, Yardangs, in Doebring, D.O., ed., Geomorphology in arid regions: Proceedings, 8th Annual Geomorphology Symposium, Binghamton, State University of New York, p. 233–269.
- McConnell, C.L., Highwood, E.J., Coe, H., Formenti, P., Anderson, B., Osborne, S., Nava, S., Desboeufs, K., Chen, G., Harrison, M.A.J., 2008. Seasonal variations of the physical and optical characteristics of Saharan dust: Results from the Dust Outflow and Deposition to the Ocean (DODO) experiment. *J. Geophys. Res.*, 113, D14S05, doi:10.1029/2007JD009606.
- McKendry IG, Hacker JP, Stull R, Sakiyama S, Mignacca D, Reid K , 2001. Long-range transport of Asian dust to the Lower Fraser Valley, British Columbia, Canada. *J Geophys Res* 106:18361–18370
- McMahon, H. 1906. Recent survey and exploration in Seistan: Journal of the Royal Geographical Society, v. 28, p. 209–228 and 333–352.
- McPeters, R. D., 1996: Nimbus-7 Total Ozone Mapping Spectrometer (TOMS) data products user's guide. NASA Ref. Publ. 1384, 73 pp.
- McTainsh, G.H. and Pitblado, J.R. (1987), Dust storms and related phenomena measured from meteorological records in Australia. *Earth Surface Processes and Landforms* 12: 415-424.
- Meloni, D., di Sarra, A., di Iorio, T., and Fiocco, G. 2005: Influence of the vertical profile of Saharan dust on the visible direct radiative forcing, *J. Quant. Spectrosc. Ra.*, 93, 347–413,
- Meloni, D., di Sarra, A., Di Iorio, T., Fiocco, G. 2004. Direct radiative forcing of Saharan dust in the Mediterranean from measurements at Lampedusa Island and MISR space-borne observations. *J. Geophys. Res.* 109, D08206, doi:10.1029/2003JD003960.
- Middleton, N. J. 1986. 'Dust storms in the Middle East', *Journal of Arid Environments*, 10, 83-96
- Middleton, N. J., 1986. Dust storms in the Middle East. *J. Arid Environ.* 10, 83-96.
- Miri, A., Ahmadi, H., Ghanbari, A., Moghaddamnia, A., 2007. Dust Storms Impacts on Air Pollution and Public Health under Hot and Dry Climate. *Int. J. Energy and Environ.* 2, 1.
- Miri, A., Moghaddamnia, A., Pahlavanravi, A., Panjehkeh, N. 2010. Dust storm frequency after the 1999 drought in the Sistan region, Iran. *Clim Res* 41:83-90
- Mishchenko M I et al 2009 Toward unified satellite climatology of aerosol properties: what do fully compatible MODIS and MISR aerosol pixels tell us? *J. Quant. Spectrosc. Radiat. Transfer* 110 402–8
- Mishchenko, M.I., and I.V. Geogdzhayev. 2007. Satellite remote sensing reveals regional tropospheric aerosol trends. *Optics Express* 15:7423-7438
- Mishra, S.K., Tripathi, S.N., 2008. Modeling optical properties of mineral dust over the Indian Desert. *J. Geophys. Res.*, 113, D23201, doi:10.1029/2008JD010048.
- Moghdamnia, A., Ghafari, M.B., Piri, J., Amin.S., Han. D., 2009. Evaporation estimation using artificial neural networks and adaptive neuro-fuzzy inference system techniques. *Adv. Water Resources* 32, 88–97.

- Mohan, M., Kandy, A., 2007. An analysis of the annual and seasonal trends of Air Quality Index of Delhi. *Environ. Monit. Assess.* 131, 267–277.
- Molesworth, A.M., Cuevas, L.E., Morse, A.P. 2002. Dust clouds and spread of infection. *Lancet* 359:81–82
- Monteil, M.A. 2002. Dust clouds and spread of infection. *Lancet* 359:81
- Morales, A.F. 1946. *El Sahara Español*. Alta Comisaría de España en Marruecos, Madrid
- Mottershead, D.N., Pye, K. 1994. Tafoni on coastal slopes, South Devon, UK. *Earth Surf Process Landforms* 19:543–563
- Mousavi, G., Nadafy, R.K., 2000. Comparative study of air quality in Tehran in 1997 and 1998, The third National Conference on Environmental Health. Kerman. 47-50(In Persian)
- Muhs, D.R., Benedict, J.B., 2006. Eolian additions to late quaternary alpine soils, Indian Peaks Wilderness Area, Colorado Front Range. *Arctic Antarctic and Alpine Research* 38 (1), 120–130.
- Myhre, G., Grini, A., Haywood, J.M., Stordal, F., Chatenet, B., Tanre, D., Sundet, J.K., Isaksen, I.S.A. 2003. Modeling the radiative impact of mineral dust during the Saharan Dust Experiment (SHADE) campaign. *J. Geophys. Res.* 108, D18, art. no. 8579.
- Nahon D, Trompette R (1982) Origin of siltstones: glacial grinding versus weathering. *Sedimentology* 29:29–35
- Nastos, T., Athanasios. G., Michael, B., Eleftheria, S.R., Kostas, N.P., 2010. Outdoor particulate matter and childhood asthma admissions in Athens, Greece: a time-series study. *Environmental Health* , 9:45, 1-9.
- Nickling WG, Gillies JA (1993) Dust emission and transport in Mali, West Africa. *Sedimentology* 40:859–868
- Nikolaou, K., Basbas, S. i Taxiltaris, C. 2004. Assessment of air pollution indicators in an urban area using the DPSIR model. *Fresenius. Environmental Bulletin*, 13: 820-830
- Nriagu, J.O., 1988. A salient epidemic of environmental metal poisoning? *Environmental Pollution* 50, 139–161.
- Nriagu, J.O., and Pacyna, J.M. 1988. Quantitative assessment of worldwide contamination of air, water and soils with trace metals. *Nature*, 333: 134–139
- O’Hara S, Wiggs G, Mamedov B, Davidson G, Hubbard RB (2000) Exposure to airborne dust contaminated with pesticide in the Aral Sea region. *Lancet* 355:627–628
- O’Leary, D.W., and Whitney, J.W., 2005a, Geological map of quadrangles 3062 and 2962, Charbuiak (609), Khannesin (610), Gawdezereh (615) and Galach (616), Afghanistan: U.S. Geological Survey Open-File Report 2005-1122A, scale 1:250,000.
- O’Leary, D.W., and Whitney, J.W., 2005b, Geological map of quadrangles 3164, Lashkargah (605) and Kandahar (606), Afghanistan: U.S. Geological Survey Open-File Report 2005-1119A, scale 1:250,000.

- Offer, Z.Y., Goossens, D. 2001. Airborne particle accumulation and composition at different locations in the Negev desert, *Zeitschrift für Geomorphologie*, 45 (2001), pp. 101–120
- Ohmura, A. (2009), Observed decadal variations in surface solar radiation and their causes, *J. Geophys. Res.*, 114, D00D05, doi:10.1029/2008JD011290.
- Orange, D., Gac, J.-Y., Probst, J.-L., Tanre, D., 1990. Mesure du depot au sol des aerosols desertiques. Une methode simple de prelevement: le capteur pyramidal. *Comptes Rendus de l'Academie des Sciences Paris* 311, 167–172.
- Ozer, P., 2001. Les lithometeores en region sahelienne. *International Journal of Tropical Ecology and Geography* 24, 1–317.
- Ozer, P., Bechir, M., Laghdaf, O.M., Gassani, J., 2006. Estimation of air quality degradation due to Saharan dust at Nouakchott, Mauritania, from horizontal visibility data. *Water Air Soil Pollut.*, 178:79–87
- Paliatsos, A.G., Priftis, K.N., Ziomas, I.C., Panagiotopoulou-Gartaganis, P., Nikolaou-Panagiotou, A., Tapratzi-Potamianou, P., Zachariadi-Xypolita, A., Nicolaïdou, P., Saxon-Papageorgiou, P: Association between ambient air pollution and childhood asthma in Athens, Greece. *Fresen Environ Bull* 2006 , 15:614-618
- Pandithurai, G., R.T. Pinker, P.C.S., Devara, T., Takamura, K.K., 2007. Seasonal asymmetry in diurnal variation of aerosol optical characteristics over Pune, western India. *J. Geophys. Res.*, 112, D08208, doi:10.1029/2006JD007803.
- Partow, Hassan, 2003, Sistan oasis parched by droughts, in *Atlas of global change*: United Nations Environmental Programme, Oxford University Press, p. 144–145.
- Patadia, F., Yang, E.-S., Christopher, S.A., 2009. Does dust change the clear sky top of atmosphere shortwave flux over high surface reflectance regions? *Geophys. Res. Lett.*, 36, L15825, doi:10.1029/2009GL039092.
- Pathak, B., G. Kalita, K., Bhuyan, P.K., Bhuyan, K., 2010. Aerosol temporal characteristics and its impact on shortwave radiative forcing at a location in the northeast of India. *J. Geophys. Res.*, 115, D19204, doi: 10.1029/2009JD013462.
- Pauley PM, Baker NL, Barker EH (1996) An observational study of the “Interstate 5” dust storm case. *Bull Am Meteorol Soc* 77:693–720
- Penner, J. E., M. Andreae, H. Annegarn, L. Barrie, J. Feichter, D. Hegg, A. Jayaraman, R. Leitch, D. Murphy, J. Nganga and G. Pitari (2001). Aerosols, Their Direct and Indirect Effects. *Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change.* C. A. Johnson. Cambridge, New York, Cambridge University Press: 289-348.
- Pérez, N., Pey, J., Querol, X., Alastuey, A., López, J. M., Viana, M., 2008. Partitioning of major and trace components in PM<sub>10</sub>–PM<sub>2.5</sub>–PM<sub>1</sub> at an urban site in . Southern Europe. *Atmospheric Environment*, 42, 1677– 1691
- Piechota, T., van, J., Batista, J., Stave, K., James, D., 2002. Potential Environmental Impacts of Dust Suppressants: “Avoiding Another Times Beach”. An Expert Panel Summary. U.S. EPA and University of Nevada, Las Vegas

- Pope, C. A., 2000. Epidemiology of fine particulate air pollution and human health: Biologic mechanisms and who's at risk?, *Environmental Health Perspectives*, 108, 713-723.
- Pozzi, R., B.D. Berardis, B.D., Paoletti, L., Guastadisegni, C., 2005. Winter urban air particles from Rome (Italy): effects on the monocytic-macrophagic RAW264.7 cell line, *Environ. Res.* 99: 344–354.
- Prados, A.I, Leptoukh, G., Johnson, J., Rui, H., Lynnes, C., Chen, A., Husar, R.B. 2010. Access, visualization, and interoperability of air quality remote sensing data sets via the Giovanni online tool. *IEEE J Selected Topics in Earth Observations and Remote Sensing*.
- Prasad, A. K. Singh, R. P. Kafatos, M. 2006, Influence of coal based thermal power plants on aerosol optical properties in the Indo-Gangetic basin, *Geophysical Research Letters*, 33(5).
- Prasad, A.K., Singh, S., Chauhan, S.S., Srivastava, M.K., Singh, R.P., Singh, R., 2007. Aerosol radiative forcing over the Indo-Gangetic Plains during major dust storms. *Atmos. Environ.* 41, 6289-6301.
- Prasad, A.K., Yang, K.-H.S., El-Askary, H.M., Kafatos, M., 2009. Melting of major glaciers in the western Himalayas: evidence of climatic changes from long term MSU derived tropospheric temperature trend (1979-2008). *Ann. Geophys.* 27, 4505-4519.
- Prospero, J. M. 1999. Long term measurements of the transport of African mineral dust to the south-eastern United States: Implications for regional air quality. *Journal Geophysical Research*, 104, 15917–15927.
- Prospero, J.M. 2004. Interhemispheric transport of viable fungi and bacteria from Africa to the Caribbean with soil dust. In: Werner D (ed) *Biological resources and their migration*. Springer, Berlin Heidelberg New York, pp. 127–132
- Prospero, J.M., Ginoux, P., Torres, O., Nicholson, S.E., Gill, T.E., 2002. Environmental characterization of global sources of atmospheric soil dust identified with the Nimbus 7 total ozone mapping spectrometer absorbing aerosol product. *Reviews of Geophysys.* 40, 2–31.
- Psenner, R. 1999. Living in a dusty world: airborne dust as a key factor for alpine lakes. *Water, Air and Soil Pollution* 112, 217-227.
- Pye, K., Sperling, C.H.B. 1983. Experimental investigation of silt formation by static breakage processes: the effect of temperature, moisture and salt on quartz dune sand and granitic regolith. *Sedimentology* 30:49–62
- Pye, K. 1987. Aeolian dust and dust deposits. Academic Press, London
- Pye, K., 1992. Aeolian dust transport and deposition over Crete and adjacent parts of the Mediterranean Sea. *Earth Surface Processes and Landforms* 17, 271–288.
- Querol, X., Alastuey, A., Rodriguez, S., Viana, M. M., Artinano, B., Salvador, P., Mantilla, E., Garcia do Santos, S., Fernandez Patier, R., Rosa, J. de la, Sanchez de la Campa, A., Menendez, M., Gil, J. J (2004) Levels of particulate matter in rural, urban and industrial sites in Spain. *Sci Total Environ* 334/335:359–376

- Quijano, A., Sokolik, I.N., Toon, O.B. 2000. Radiative heating rates and direct radiative forcing by mineral dust in cloudy atmospheric conditions. *J. Geophys. Res.* 105, 12207-12219.
- Rahn KA, Borys RA, Shaw GE .1977. The Asian source of Arctic haze bands. *Nature* 268:712–714
- Raloff, J. 2001. Ill winds. *Sci News* 160:218–220
- Ralph, M.O., Barrett, C.F., 1976. Awind-tunnel study of the efficiencyof deposit gauges— interim report. Report LR 235 (AP). Warren Spring Laboratory, Stevenage, UK.
- Ramachandran, S., Kedia, S., 2010. Black carbon aerosols over an urban region: Radiative forcing and climate impact. *J. Geophys. Res.*, 115, D10202, doi:10.1029/2009JD013560.
- Ramachandran, S., Rajesh, T.A., 2007. Black carbon aerosol mass concentrations over Ahmedabad, an urban location in western India: Comparison with urban sites in Asia, Europe, Canada and USA. *J. Geophys. Res.*, 112, D06211, doi:10.1029/2006JD007488.
- Ramanathan, V., Crutzen, P. J., Kiehl, J. T., and Rosenfeld, D., 2001, Aerosols climate and the hydrological cycle *Science* 294 2119–24
- Ramanathan, V., Ramana, M. V., Roberts, G., Kim, D., Corriganm, C., Chung, C., andWinker, D. 2007. Warming trends in Asia amplified by brown cloud solar absorption, *Nature*, 448, 575–578.,
- Ranjbar, M., and Iranmanesh, F. 2008. Effects of "Drought" on "Wind Eroding and Erosion" in Sistan Region with use of Satellite Multiple Images. *WSEAS*, ISSN: 1792-4294.
- Rashki, A., Kaskaoutis, D.G., Rautenbach, C.J.deW., Eriksson, P.G.,Giang, M, Gupta, P., 2012. Dust storms and their horizontal dust loading in the Sistan region, Iran. *Aeolian Research*, vol 5, p 51-62
- Rashki, A., Rautenbach, C.J.deW., Eriksson, P.G., Kaskaoutis, D.G., Gupta, P., 2011. Temporal changes of particulate concentration in the ambient air over the city of Zahedan, Iran. *Air Quality, Atmosphere & Health*. DOI: 10.1007/s11869-011-0152-5
- Rea, D.K. 1994. The paleoclimatic record provided by Eolian deposition in the deep sea: The geologic history of wind. *Reviews of Geophysics* 32, 159-195.
- Reheis, M.C., Kihl, R., 1995. Dust deposition in southern Nevada and California, 1984–1989—relations to climate, source area, and source lithology. *Journal of Geophysical Research-Atmospheres* 100 (D5), 8893–8918.
- Remer, L.A. , et al. 2005. The MODIS aerosol algorithm, products, and validation. *J. Atmos. Sci.* 62, 947-973.
- Remer, L.A., Tanre, D., Kaufman, Y.J., Ichoku, C., Matoo, S., Levy, R., Chu, D.A., Holben, B., Dubovik, O., Ahmad, Z., Smirnov, A., Martins, J.V., Li, R.R. 2002. Validation of MODIS aerosol retrieval over ocean. *Geophys. Res. Lett.* 29, doi:10.1029/2001GL013204.
- Rietveld H.M. 1969. A profile refinement method for nuclear and magnetic structures. *J. ppl. Crystallogr.*2:65–71.

- Rodriguez, S., Querol, X., Alastuey, A., Kallos, G., Kakaliagou, O. 2001. Saharan dust contributions to PM<sub>10</sub> and TSP levels in Southern and Eastern Spain. *Atmos. Environ.* 35, 2433–2447.
- Rosenfeld, D., Lohmann, U., Raga, G. B., O'Dowd, C. D., Kulmala, M., Fuzzi, S., Reissell, A., Andreae, M. O., 2008. Flood or Drought: How do aerosols affect precipitation?. *Science*, 321, 1309, DOI: 10.1126/science.1160606.
- Rosenfeld, D., Rudich, Y., and Lahav, R.: Desert dust suppressing precipitation: A possible desertification feedback loop, *P. Natl. Acad. Sci. USA*, 98, 5975–5980, 2001.
- Rutherford S, Clark E, McTainsh GH, Simpson R, Mitchell C (1999) Characteristics of rural dust events shown to impact on asthma severity in Brisbane, Australia. *Int J Biometeorol* 42:217–225
- Samoli, E., Kougea, E., Kassomenos, P., Analitis, A., Katsouyanni, K., 2011. Does the presence of desert dust modify the effect of PM10 on mortality in Athens, Greece? *Sci. Total Environ.* 409, 2049–2054.
- Satheesh, S.K., Krishna Moorthy, K. 2005. Radiative effects of natural aerosols: A review. *Atmos. Environ.* 35, 2089–2110.
- Satheesh, S.K., Moorthy, K.K., Kaufman, Y.J., Takemura, T., 2006. Aerosol optical depth, physical properties and radiative forcing over the Arabian Sea. *Meteorol. Atmos. Phys.* 91, 45–62.
- Scheff, P.A., Wadden, R.A., Ticho, K.K.L., Nakonechniy, J.J., Prodanchuk, M., and Hryhorczuk, D.O., 1997, Toxic air pollutants in chernivtsi, Ukraine. *Environmental International*, 23 3, 273–290,
- Schütz, L., Sebert, M., 1987, Mineral aerosols and source identification, *Journal of Aerosol Science*, 18 (1), pp. 1–10
- Schwartz J. 2004. Air pollution and children's health. *Pediatrics* 113:1037–1043.
- Selinus, O., Finkelman, R.B., Centeno, J.A, 2010, Medical Geology: A regional synthesis, springer. pp: 391
- Shao, Y. 2001. A model for mineral dust emission. *J Geophys Res* 106: 20,239–20,254
- Shao, Y. 2010. Physics and modelling of wind erosion, springer
- Shao, Y., Li, A. 1999. Numerical modelling of saltation in atmospheric surface layer. *Boundary-Layer Meteorol* 91: 199–225
- Shao, Y., McTainsh, G.H., Leys, J.F., Raupach, M.R. 1993. Efficiency of sediment samplers for wind erosion measurement. *Aust J Soil Res* 31: 519–532
- Sharma, A. R., Kharol, S. K., Badarinath, K. V. S., and Singh, D. 2010: Impact of agriculture crop residue burning on atmospheric aerosol loading – a study over Punjab State, India, *Ann. Geophysicae*, 28, 367–379.,
- Shaw, G. E. 1980. Transport of Asian desert aerosol to the Hawaiian Islands. *Journal of Applied Meteorology*, 19, 1254–1259.
- Shinn, E. A., Smith, G. W., Prospero, J. M., Betzer, P., Hayes, M. L., Garrison, V., Barber, R.T. 2000. African dust and the demise of Caribbean coral reefs. *Geophys. Res. Lett.* 27 (19), 3029–3032.

- Singh, R.P., Prasad, A.K., Kayetha, V.K., Kafatos, M., 2008. Enhancement of oceanic parameters associated with dust storms using satellite data. *J. Geophys. Res.*, 113, C11008, doi:10.1029/2008JC004815.
- Singh, R.P., S. Dey, S.N. Tripathi, V. Tare, B. Holben 2004. Variability of aerosol parameters over Kanpur, northern India. *J. Geophys. Res.*, 109, D23206, doi:10.1029/2004JD004966.
- Sinyuk, A., Torres, O., Dubovik, O. 2003. Combined use of satellite and surface observations to infer the imaginary part of the refractive index of Saharan dust. *Geophys. Res. Lett.* 30, 201081, doi:10.1029/2002GL016189
- Sivagangabalan, G., Spears, D., Masse, S., Urch, B., Brook, R.D., Silverman, F., Gold, D.R., Lukic, K.Z., Speck, M., Kusha, M., Farid, T., Poku, K., Shi, E., Floras, J., Nanthakumar, K., 2010. Mechanisms of Increased Arrhythmic Risk Associated With Exposure to Urban Air Pollution. *Circulation*, 122, A17901
- Sivall, T.R., 1977, Synoptic-climatological study of the Asian summer monsoon in Afghanistan: *Geografiska Annaler*, v. 59, p. 67–87.
- Skärby, L., 1977. Correlation of moss analysis to direct measurement by deposit gauge of cadmium, lead, and copper. Swedish Water and Air Pollution Research Laboratory, Publ. B377a.
- Smalley IJ (1966) The properties of glacial loess and the formation of loess deposits. *J Sediment Petrol* 36:669–676
- Smalley IJ, Vita-Finzi C (1968) The formation of fine particles in sandy deserts and the nature of ‘desert’ loess. *J Sediment Petrol* 38:766–774
- Smalley, I.J., Kumar, R., O’Hara Dhand, K., Jefferson, I.E., Evans, R.D., 2005. The formation of silt material for terrestrial sediments: particularly loess and dust. *Sediment Geol* 179:321–328
- Smirnov, A., Holben, B.N., Dubovic, O., O’Neill, N.T., Eck, T.F., Westphal, D.L., Goroth, A.K., Pietras, C., Slutsker, I., 2002. Atmospheric aerosol optical properties in the Persian Gulf. *J. Atmos. Sci.* 59, 620-634.
- Smith, B.J., McGreevy, J.P., Whalley, W.B. 1987. The production of silt-size quartz by experimental salt weathering of a sandstone. *J Arid Environ* 12:199–214
- Smith, B.J., Wright, J.S., Whalley, W.B. 2002. Sources of non-glacial, loess-size quartz silt and the origins of “desert loess”. *Earth Sci Rev* 59:1–26
- Sokolik I., Winker D., Bergametti G., Gillette D., Carmichael G., Kaufman Y., Gomes L., Schuetz L., and Penner J. 2001. Introduction to special section: outstanding problems in quantifying the radiative impacts of mineral dust.
- Sokolik, I. N., Toon, O. B., 1999. Incorporation of mineralogical composition into models of the radiative properties of mineral aerosol from UV to IR wavelengths. *J. Geophys. Res.*, 104(D8), 9423-9444.
- Sokolik, I.N., Toon, O.B., Bergstrom, R.W., 1998. Modeling the radiative characteristics of airborne mineral aerosols at infraredwavelengths. *Journal of Geophysical Research- Atmospheres* 103 (D8), 8813–8826
- Sturges, W.T., Harrison, R.M. , Barrie L.A., 1989. Semi-quantitative XRD analysis of size fractionated atmospheric particles, *Atmospheric Environment*, 23 , 1083–1098

- Sultan, B., Labadi, K., Guegan, J.F., Janicot, S. 2005. Climate drives the meningitis epidemics onset in West Africa. *Plos Medicine* 2, 43-49.
- Sun, J., M. Zhang, and T. Liu, 2001: Spatial and temporal characteristics of dust storms in China and its surrounding regions, 1960–1999: Relations to source area and climate. *J. Geophys. Res.*, 106, 10 325–10 333
- Sun, Y., Zhuang, G., Yun, H., Zhang, X., Guo, J., 2004. Characteristics and sources of 2002 super dust storm in Beijing. *China Science Bulletin* 49, 698–705
- Ta, W., Wang, T., Xiao, H., Zhu, X., Xiao, Z. 2004. Gaseous and particulate air pollution in the Lanzhou Valley, China. *Sci Total Environ* 320:163–176
- Takahashi, Koichiro, and Arakawa, H., ed., 1981, Climates of southern and western Asia: Elsevier Publishing Company (World Survey of Climatology, v. 9), 333 p.
- Talbot M.R. and Allen P.A. 1996. Lakes. in *Sedimentary Environments: Reading H.G. (ed), Processes, Facies and Stratigraphy*, Blackwell: Oxford, 83–124.
- Tanaka TY, Kurosaki Y, Chiba M, Matsumura T, Nagai T, Yamazaki A, Uchiyama A, Tsunematsu N, Kai K (2005) Possible transcontinental dust transport from North Africa and the Middle East to East Asia. *Atmos Environ* 39:3901–3909.
- Tanré, D., Kaufman, Y. J., Herman, M., and Mattoo, S. 1997. Remote sensing of aerosol properties over oceans using the MODIS/EOS spectral radiances., *J. Geophys. Res.*, 102, 16,971– 16,988.
- Tate, G.P., 1910–12, Seistan, A memoir on the topography, ruins, and people: Calcutta, Superintendent of Printing, 4 volumes, 374 p.
- Tegen, I., Fung, I., 1994. Modeling of mineral dust in the atmosphere: sources, transport, and optical thickness. *J. Geophys. Res.* 99, 22897–22914.
- Tegen, I., Lacis, A.A., Fung, I., 1996. The influence on climate forcing of mineral aerosols from disturbed soils. *Nature*, 380, 419-422.
- Thurston, G.D., Spengler, J.D., 1985, A quantitative assessment of source contributions to inhalable particulate matter pollution in metropolitan Boston. *Atmospheric Environment*, 19, 9–25.
- Tirrul, R., Bell, I. R., Griftis, R. J., Camp, V. E., 1983. The Sistan suture zone of eastern Iran. *Bull. of Geological Soc. of America*, 94, 134-150.
- Torres, O., Bhartia, P.K., Herman, J.R., Ahmad, Z., Gleason, J. 1998. Derivation of aerosol properties from satellite measurements of backscattered ultraviolet radiation: Theoretical basis. *J. Geophys. Res.* 103, 17099–17110.
- Torres, O., Bhartia, P.K., Herman, J.R., Sinyuk, A., Ginoux, P., Holben, B. 2002. A long-term record of aerosol optical depth from TOMS observations and comparison to AERONET measurements. *J. Atmos. Sci.* 59: 398-413
- Tosi, M., 1973, L'industria litica e italiana, lavorazione degli elementi di collana a Shahr-i-Sokhta (Iran): *Geo-Archeologia*, v. 1, p. 23–29.
- Tosi, M., 1976, A topographical and stratigraphical periplus of Sahr-e Suxteh, in Bagherzadeh, F., ed.: *Proceedings of the 4th Annual Symposium on Archeological Research in Iran*, 3–8 November, Tehran, 1975, p. 130–158.

- Triantafyllou, A.G., Evangelopoulos, V., Zoras, S., 2006. Design of a web-based information system for ambient environmental data. *Journal of Environmental Management*, 80, 230-236.
- Twomey, S.A. 1959. The Nuclei of Natural Cloud Formation. Part II: The Supersaturation in Natural Clouds and the Variation of Cloud Droplet Concentrations. *Geofis. Pure Appl.* 43, 227-242.
- U.S. Agency for International Development, 1976, Helmand River Basin—Soil and water survey study report: Open File Report in Kabul, 180 p.
- United Nations Environment Programme (UNEP). 2006. History of Environmental Change in the Sistan Basin Based on Satellite Image Analysis:1976 – 2005. P: 60
- USEPA, 2006. Guideline for Reporting of Daily Air Quality: Air Quality Index, Environmental Protection Agency, Washington, DC. P. 17.
- Usher, C.R., Michel, A.E., VH Grassian, V.H. 2003. Reactions on mineral dust, *Chemical Review*, 103 (12), 4883–4940
- Wang, J., Christopher, S.A., 2003. Intercomparison between satellite-derived aerosol optical thickness and PM<sub>2.5</sub> mass: implications for air quality studies. *Geophysical Research Letters* 30. doi:10.1029/2003GL018174.
- Wang, Y., Guoshun, Z., Xingying, Z., Kan, H., Chang, X., Aohan, Jianmin, C. and Zhisheng, A. 2006. The Ion Chemistry, Seasonal Cycle, and Sources of PM<sub>2.5</sub> and TSP Aerosol in Shanghai. *Atmos. Environ.* 40: 2935– 2952
- Wang, Y., Zhuang, G., Tang, A., Zhang, W., Sun, Y., Wang, Z., et al. 2007. The evolution of chemical components of aerosols at five monitoring sites of China during dust storms. *Atmospheric Environment*, 41, 1091–1106. doi:10.1016/j.atmosenv.2006.09.015.
- Washington, R., Todd, M.C., Middleton, N.J., Goudie, A.S., 2003. Dust-storm source areas determined by the total ozone monitoring spectrometer and surface observations. *Annals of the Association of American Geographers* 93, 297-313.
- Wedepohl, K.H., 1971. Environmental influences on the chemical composition of shales and clays. In: Ahrens, L.H., Press, F., Runcorn, S.K., Urey, H.C. (Eds.), *Physics and Chemistry of the Earth*. Pergamon, Oxford, UK, pp. 307–331
- Wedepohl, K.H., 1971. Environmental influences on the chemical composition of shales and clays. In: Ahrens, L.H., Press, F., Runcorn, S.K., Urey, H.C. (Eds.), *Physics and Chemistry of the Earth*. Pergamon, Oxford, UK, pp. 307–331
- Wentworth CK (1922) A scale of grade and class terms for clastic sediments. *J Geol* 30:377–392
- Whitney, J. W., 2006. Geology, Water, and Wind in the Lower Helmand Basin, Southern Afghanistan U.S. Geological Survey, Reston, Virginia, Retrieved 2010-08-31
- Whitney, J.W., and Trousdale, W., 1982, Catastrophic floods, wind erosion, and historical occupation on the Helmand River delta, southwest Afghanistan: American Quaternary Association, 7th biennial conference, June 28–30, Seattle, Wash., p. 180.
- Whitney, J.W., and Trousdale, W., 1984, Man versus sand in southwest Afghanistan: Geological Society of America Abstracts with Programs, v. 16, no. 7, p. 693.

- WHO, 2003. Health aspects of air pollution with particulate matter, ozone and nitrogen dioxide. World Health Organization, 98 pp
- Wild, M. 2012. enlightening global dimming and brightening. *bull. american meteor. soc.* doi:10.1175/bams-d-11-00074.1, pp. 27-37
- Williams P, Young M (1999) Costing dust. (CSIRO Land and Water, Policy and Economic Research Unit, Final Report). CSIRO, Canberra, 36 pp
- Wilson, A. M., Salloway, J. C., Wake, C. P., Kelly, T., 2004. Air pollution and demand for hospital services: A review. *Environ. Int.*, 30, 1109-1018
- Wilson, W.E., Chow, J.C. Claiborn, C. Fusheng, W. Engelbrecht, J. and Watson, J.G., 2002, Monitoring of particulate matter outdoors. *Chemosphere*, 49, 1009–1043
- Wittekindt, Hans, and Weippert, D., compilers, 1973, Geologische Karte von Zentral-und Sudafghanistan: Hannover, Bundesanstalt fur Bodenforschung, 4 sheets, scale 1:500,000
- Wood, W. W., & Sanford, W. E. 1995. Eolian transport, saline lake basins and groundwater solutes. *Water Resources Research*, 31, 3121–3129.
- Wright, J. 2002. Granitoid weathering profiles as a source of loessic silt. *Trans Jpn Geomorphol Union* 23/25:769–793
- Wright, J. 2001a. Making loess-sized silt: data from laboratory simulations and implications for sediment transport pathways and the formation of ‘desert’ loess deposits associated with the Sahara. *Quat Int* 76/77:7–19
- Wright, J. 2001b. “Desert” loess versus “glacial” loess: quartz silt formation, source areas and sediment pathways in the formation of loess deposits. *Geomorphology* 36:231–256
- Wu, P.C., Tsai, J.C., Li, F.C., Lung, S.C., Su, H.J. (2004) Increased levels of ambient fungal spores in Taiwan are associated with dust events from China. *Atmos Environ* 38:4879–4886
- Xi, X., and Sokolik, I.N. 2012. Impact of Asian dust aerosol and surface albedo on photosynthetically active radiation and surface radiative balance in dryland ecosystems. *Advances in Meteorology*, (in press)
- Yang, C.Y., Chen, Y.S, Chiu, H.F., Goggins, W.B, 2005. Effects of Asian dust storm events on daily stroke admissions in Taipei, Taiwan. *Environ Res* 99:79–84
- Yang, G., Xiao, H., Tuo, W. 2001. Black windstorms in northwest China: a case study of three strong sand-dust storm of May 5th 1993. In: Yang Y, Squires V, Qi L (eds) Global alarm: dust and sandstorms in the world’s drylands. UNESCO, Bangkok, pp. 49–73
- Yang, X.P., Zhu, B.Q., White, P.D. 2007, Provenance of aeolian sediment in the Taklamakan Desert of western China, inferred from REE and major-elemental data. *Quaternary International* 175, 71–85.
- Yoon, J., von Hoyningen-Huene, W., Vountas, M., and Burrows, J. P. 2011. Analysis of linear longterm trend of Aerosol Optical Thickness derived from SeaWiFS using BAER over Europe and South China, *Atmos. Chem. Phys. Discuss.*, 11, 20757–20792, doi:10.5194/acpd-11- 20757-2011,.

- Yung, Y.L., Lee, T., Wang, C.-H., Shieh, Y.-T. 1996. Dust: A diagnostic of the hydrologic cycle during the Last Glacial Maximum, *Science*, 271, 962–963,
- Zarasvandi, A., 2009, Environmental impacts of dust storms in the Khuzestan province, Environmental Protection Agency (EPA) of Khuzestan province, Internal Report, 375p
- Zawar-Reza P, Kingham S, Pearce J. Evaluation of a year-long dispersion modelling of PM<sub>10</sub> using the mesoscale model TAPM for Christchurch. *New Zealand Sci Total Environ* 2006;349: 249–59.
- Zender, C.S., Miller, R.L., Tegen, I., 2004. Quantifying mineral dust mass budgets: terminology, constraints, and current estimates. *EOS, Transactions, American Geophysical Union* 85 (48), 509–512.
- Zhang J., J. Reid, D. Westphal, E. Hyer, N. Baker, J. Campbell,. 2010. multi-sensor aerosol data assimilation, *Aerosol Observability Workship*, Monterey, CA, April, 2010
- Zhang, D. D., Peart, M., Jim, C. Y., He, Y. Q., Li, B. S., & Chen, J. A. 2003. Precipitation chemistry of Lhasa and other remote towns, Tibet. *Atmospheric Environment*, 37, 231–240.
- Zhang, D.E., 1985. Meteorological characteristics of dust fall in China since the historic times. In: Liu, T.S. (Ed.), *Quaternary Geology and Environment of China*. China Ocean Press, Beijing, pp. 45–56
- Zhao, X., Zhuang, G., Wang, Z., Sun, Y., Wang, Y., Yuan, H., 2007. Variation of sources and mixing mechanism of mineral dust with pollution aerosol in a super dust storm —revealed by the two peaks of a super dust storm in Beijing, *Atmospheric Research* 84, 265-279