

Appendix C: Modelling temporal autocorrelation in LMMs

Foraging behaviour of Weddell seals (*Leptonychotes weddellii*) in connection to oceanographic conditions in the southern Weddell Sea

Dominik A. Nachtsheim^{a,b,c,*}, Svenja Ryan^a, Michael Schröder^a, Laura Jensen^a, W. Chris Oosthuizen^d, Marthán N. Bester^d, Wilhelm Hagen^c, Horst Bornemann^a

^a Alfred-Wegener-Institut, Helmholtz-Zentrum für Polar- und Meeresforschung, Am Handelshafen 12, 27570 Bremerhaven, Germany

^b present address: Institute for Terrestrial and Aquatic Wildlife Research, University of Veterinary Medicine Hannover, Werftstrasse 6, 25761 Büsum, Germany

^c BreMarE - Bremen Marine Ecology, Marine Zoology, University of Bremen, P.O. Box 330440, 28334 Bremen, Germany

^d Mammal Research Institute, Department of Zoology and Entomology, University of Pretoria, Private Bag X20, Hatfield, Pretoria 0028, South Africa

* corresponding author: Dominik A. Nachtsheim

e-mail: dominik.nachtsheim@tiho-hannover.de

telephone: +49 511 856-8159

fax: +49 511 856-8181

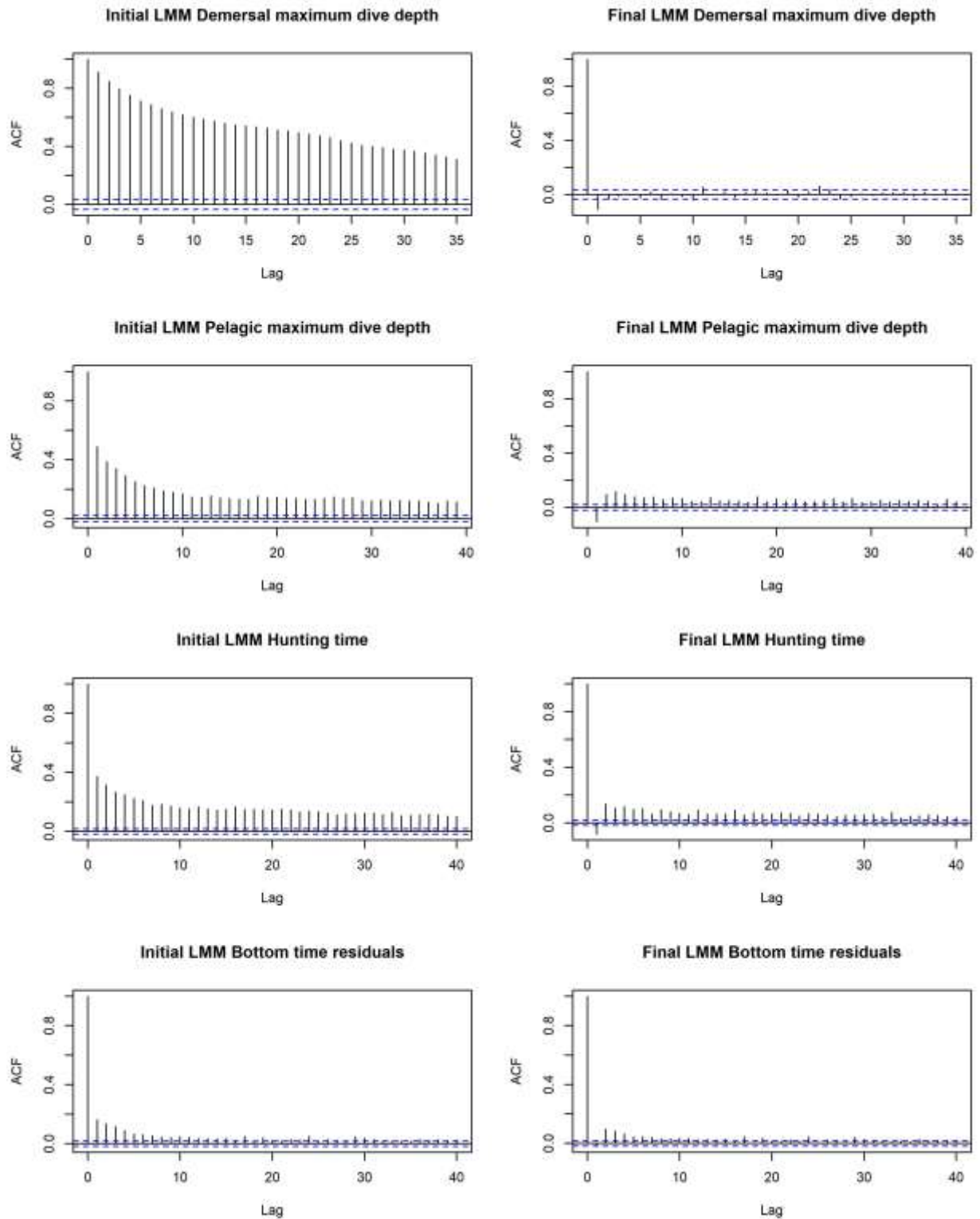


Fig. C.1 Temporal autocorrelation function (ACF) plots for initial and final linear mixed effect models (LMMs) for all four foraging metrics. Autocorrelation decreased substantially by adding an auto-regressive model of the order 1 (AR1) to the final LMMs. The constant model parameter ρ used for AR1 in the LMMs was 0.9 for demersal maximum dive depth, 0.5 for

pelagic maximum dive depth, 0.38 for hunting time and 0.16 for bottom time residuals, respectively.