# Appendix J

# Illustration of the Influence of Change Frequency, Change Severity, and Number of Nodes on the Optimisation Criteria

This appendix presents FluxViz graphs to illustrate the influence of change frequency, $T_{sm}$ and change severity, $R_g$, on the $EP$, $TNP$, $VNP$, $CP$ and $MNC$ optimisation criteria for different number of nodes, $N_G$. Figures J.1-J.3 visualise the influence of $T_{sm}$ and $R_g$ on the $EP$ criterion based on the results of Tables I.1-I.9. Figures J.4–J.6 visualise the influence of $T_{sm}$ and $R_g$ on the $TNP$ criterion based on the results of Tables I.10-I.18. Figures J.7-J.9 visualise the influence of $T_{sm}$ and $R_g$ on the $VNP$ criterion based on the results of Tables I.19-I.27. Figures J.10-J.12 illustrate the influence of $T_{sm}$ and $R_g$ on the $CP$ criterion based on the results of Tables I.28-I.36, while Figures J.13-J.15 visualise the influence of $T_{sm}$ and $R_g$ on the $MNC$ criterion based on the results of Tables I.37-I.45.
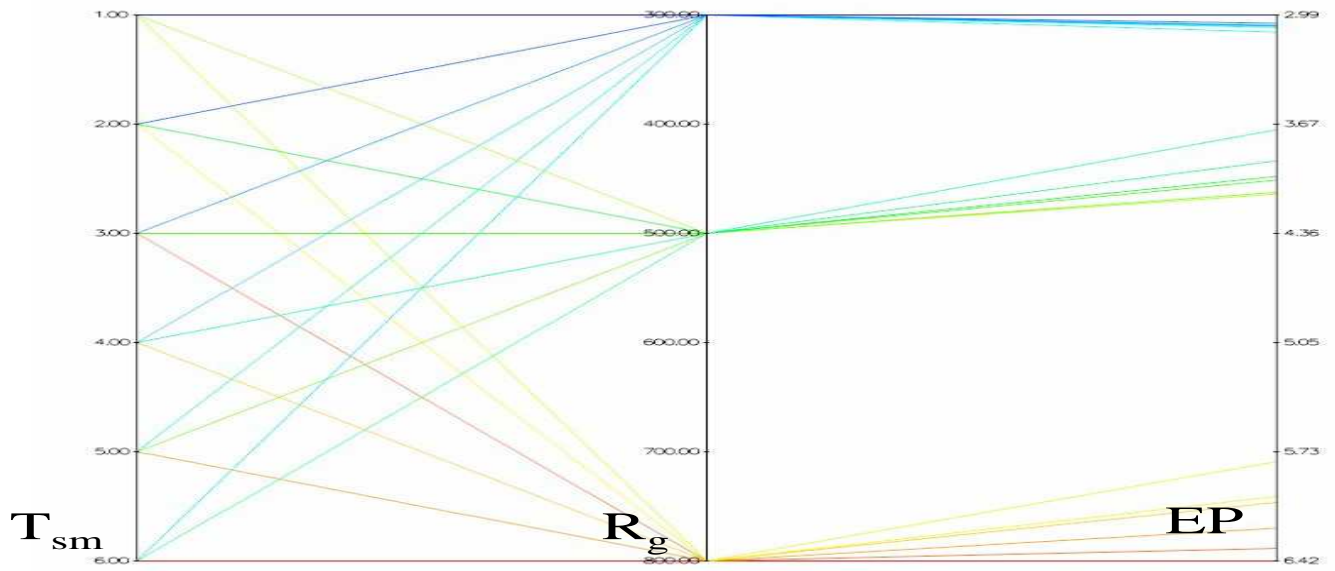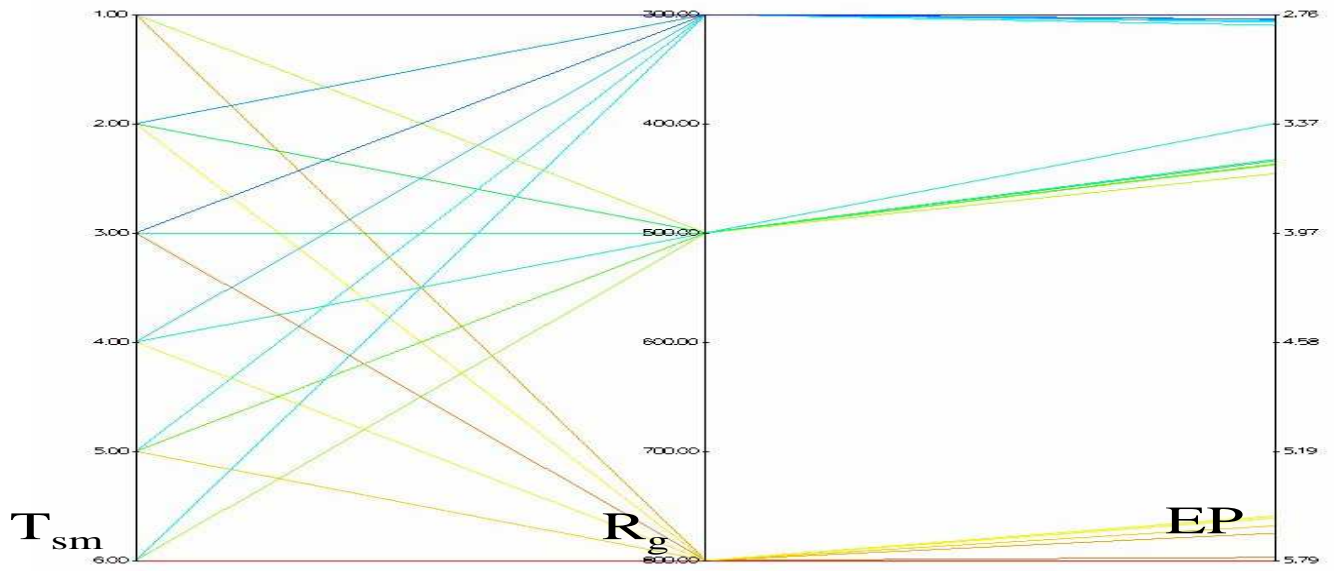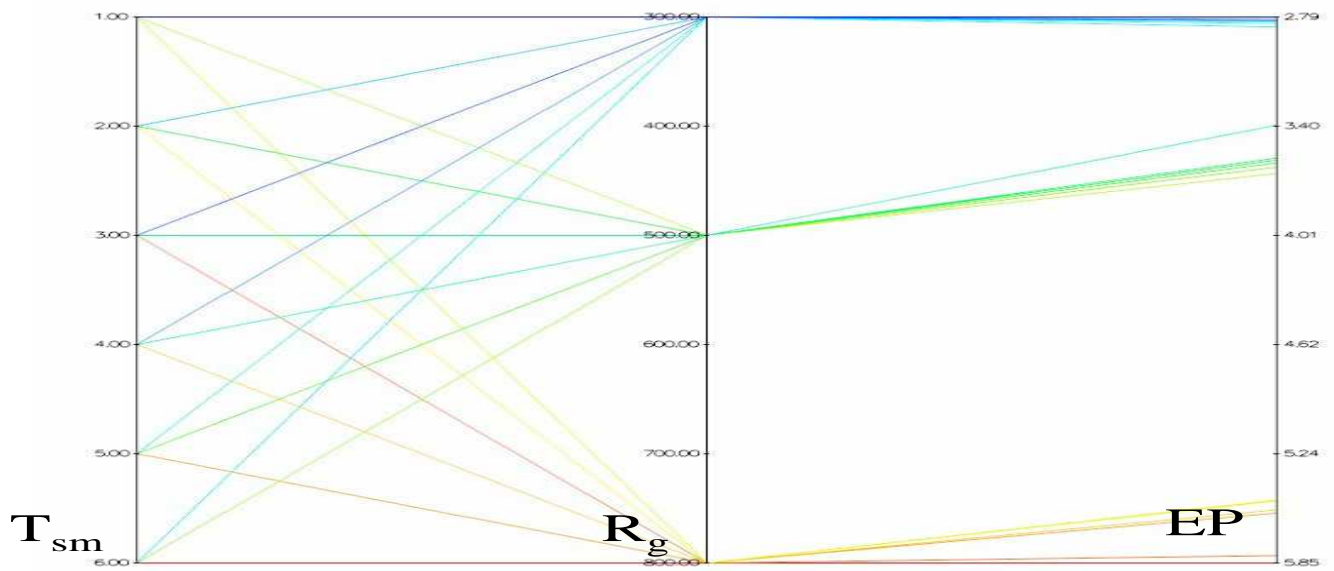
(a) EEMACOMP
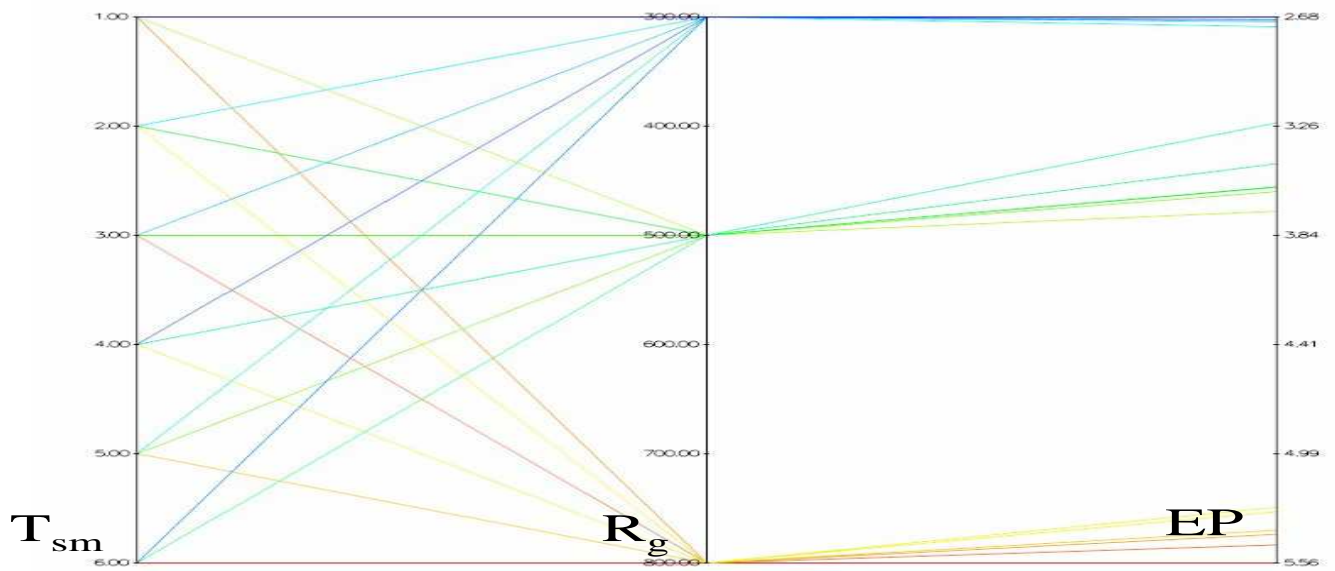


(b) EEMACOMH

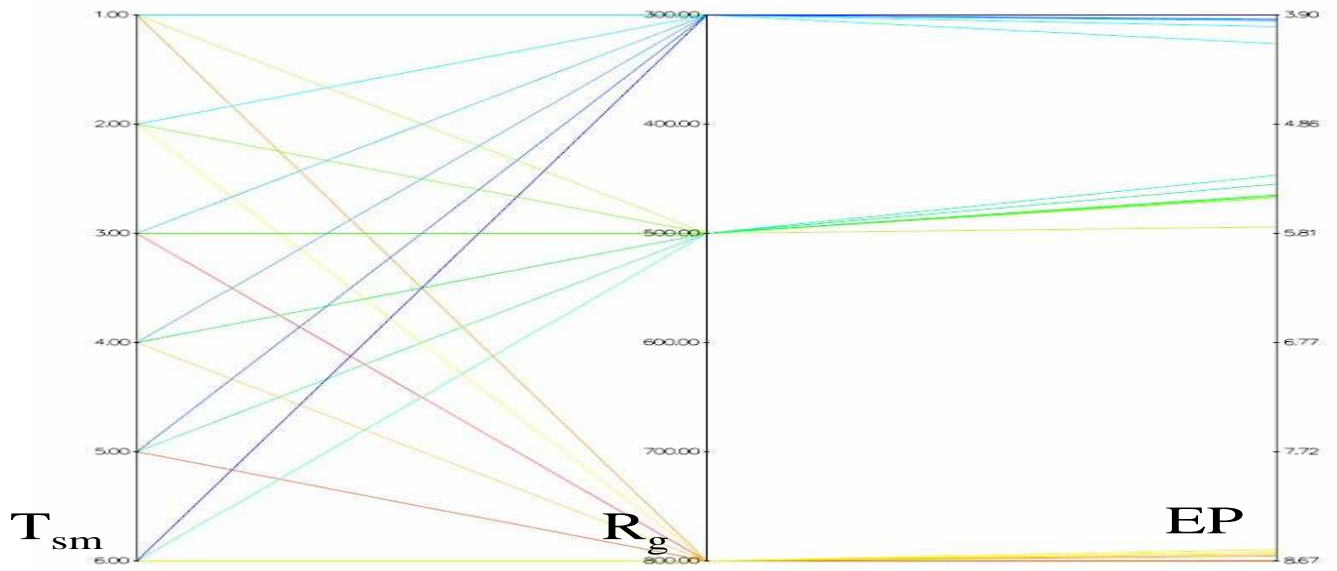Figure J.1: Influence of $R_g$ and $T_{sm}$ on the EP objective for $N_G = 30$
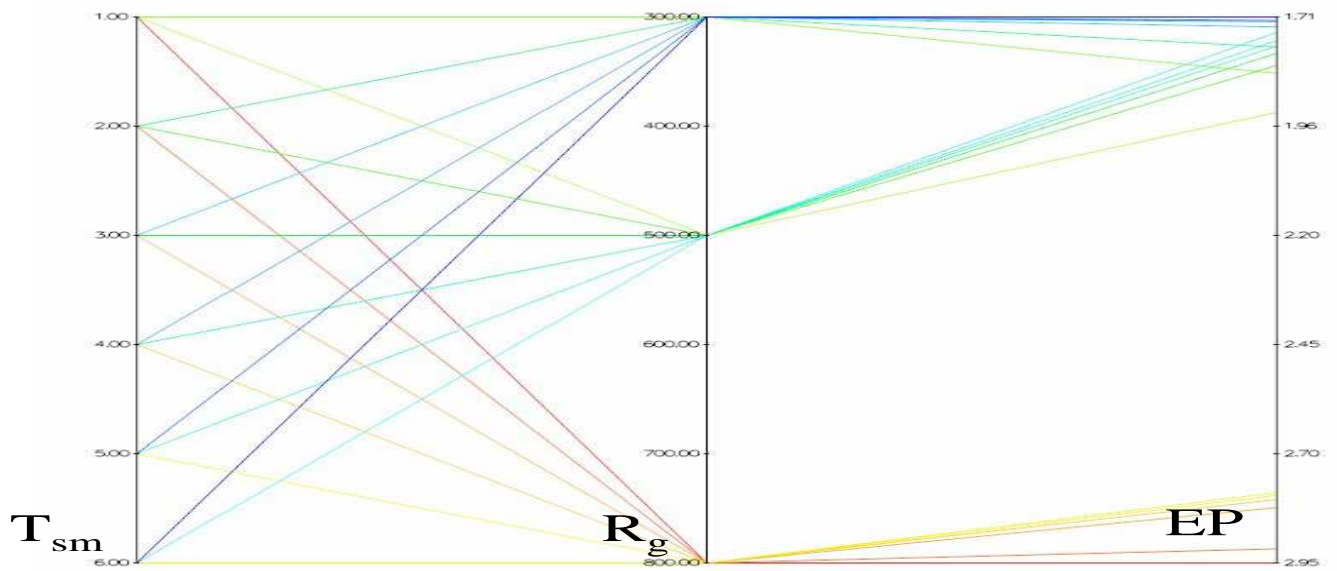
(c) EEMMASMP



(d) EEMMASMH

Figure J.1: Influence of $R_g$ and $T_{sm}$ on the EP objective for $N_G = 30$ (cont.)
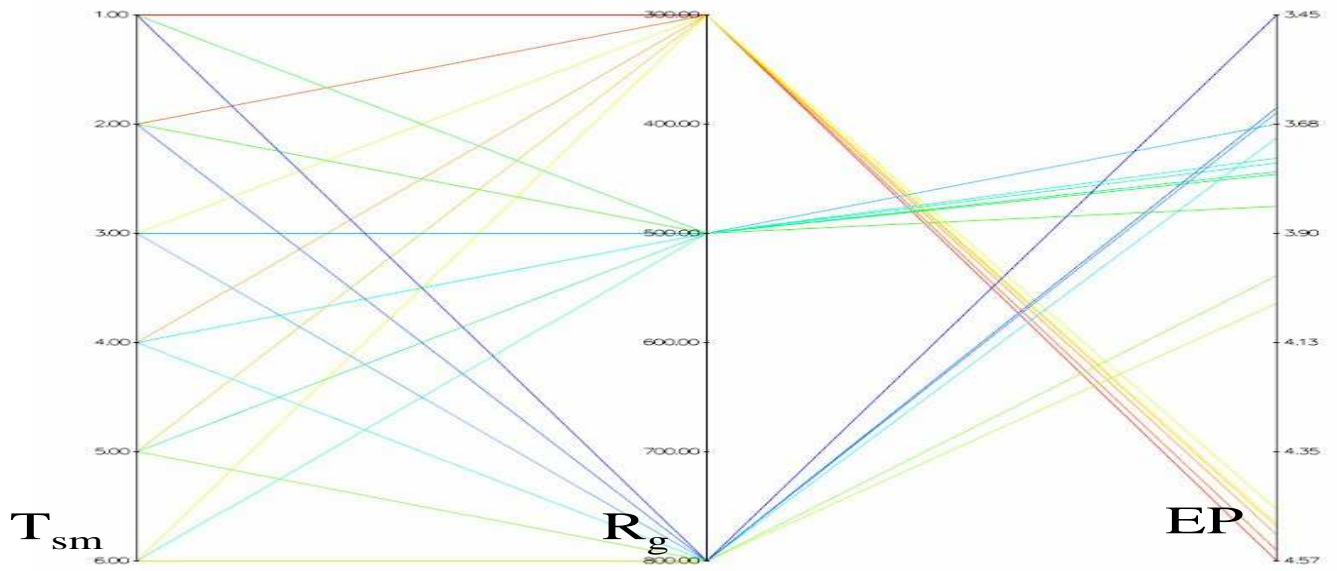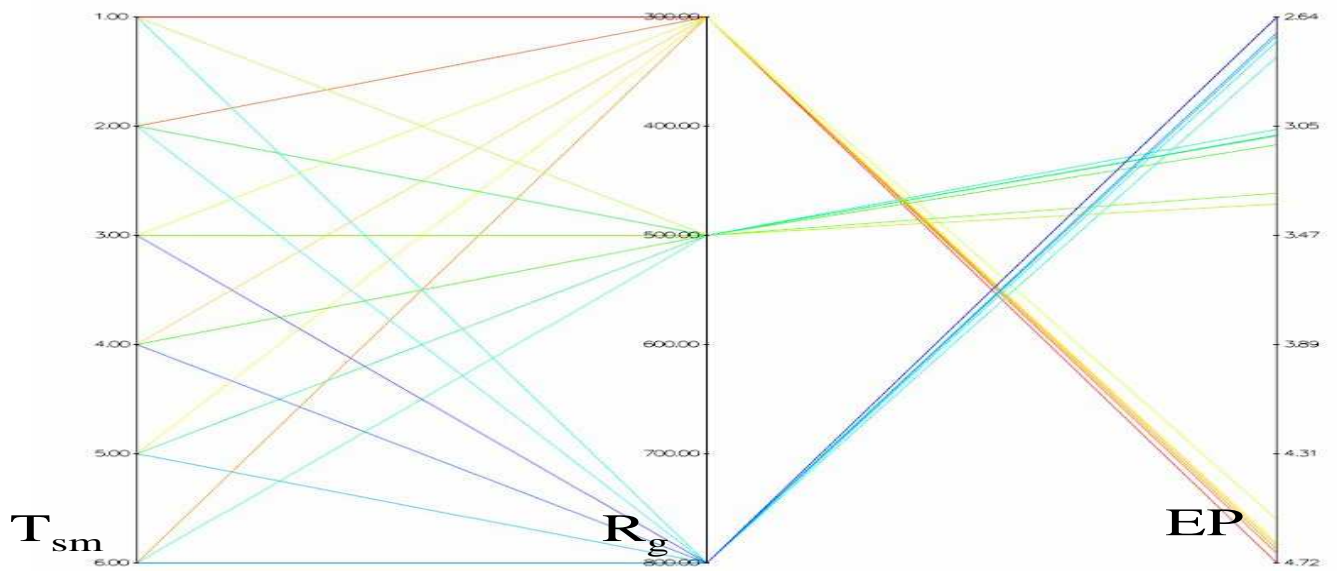
(e) EEMACOMC



(f) NSGA-II-MPA

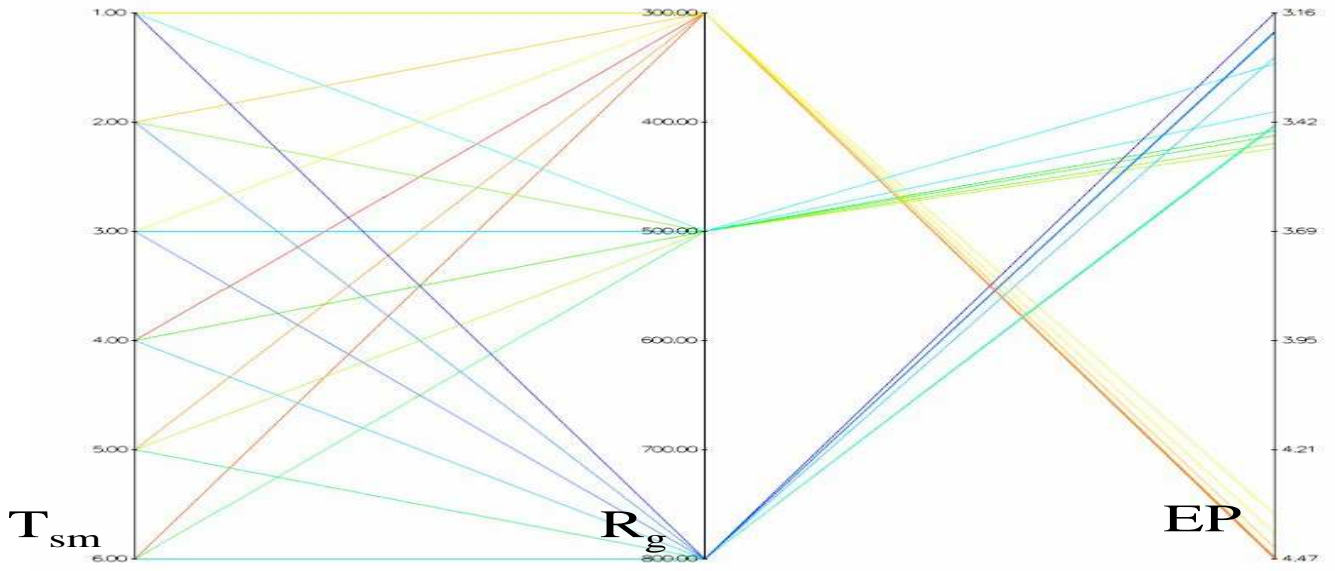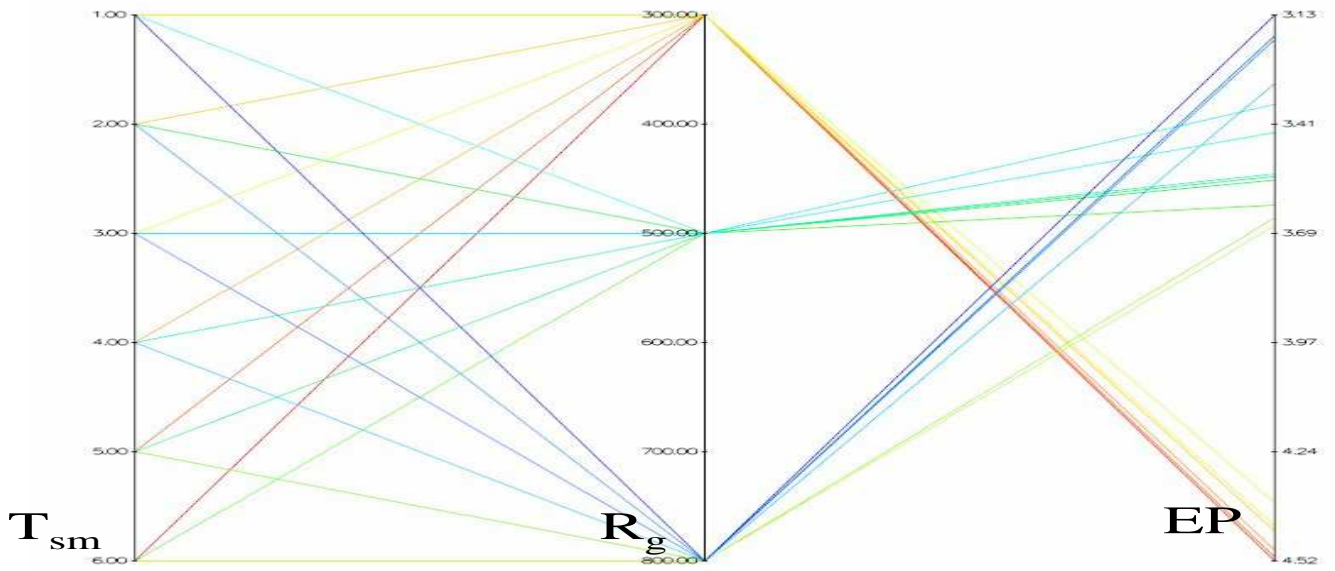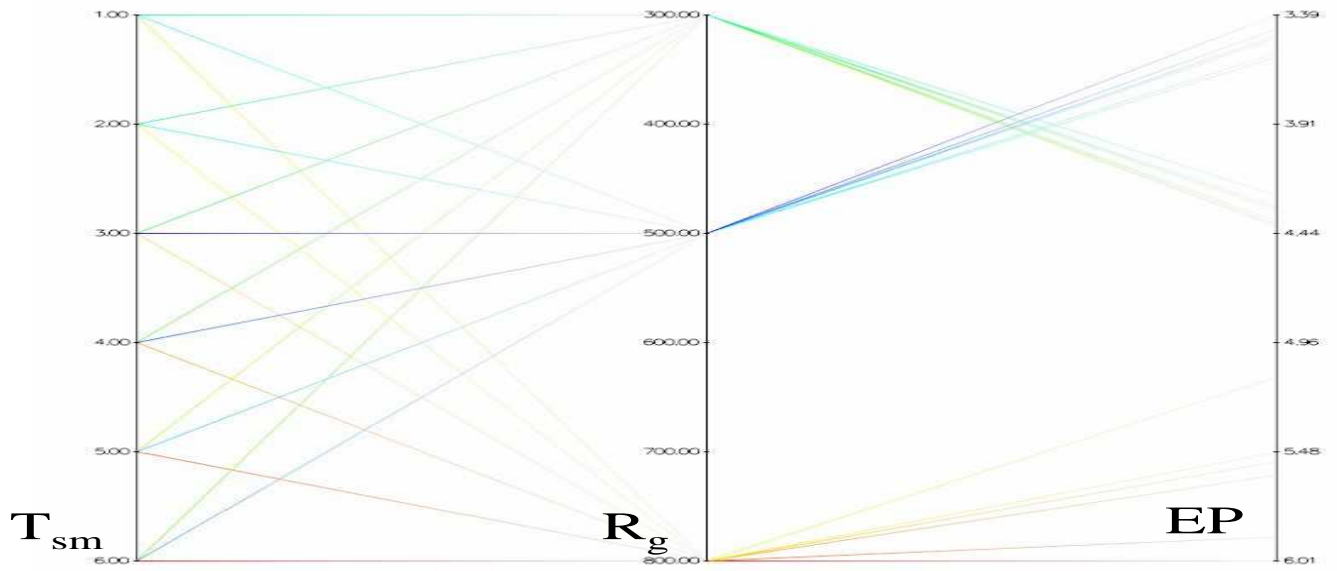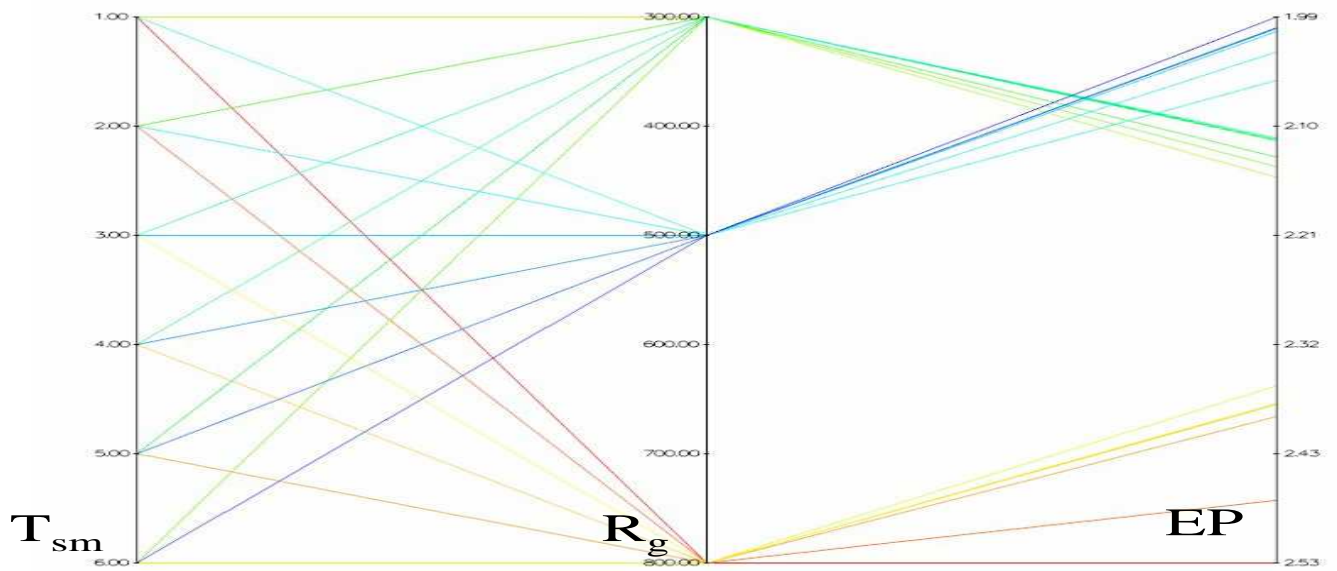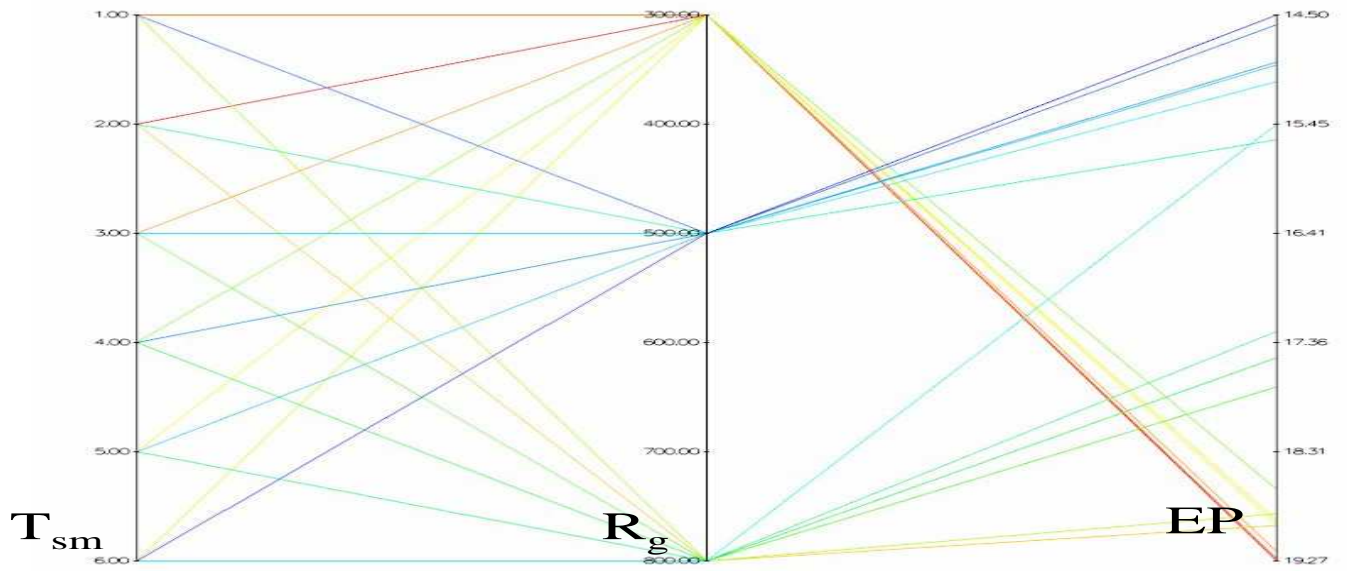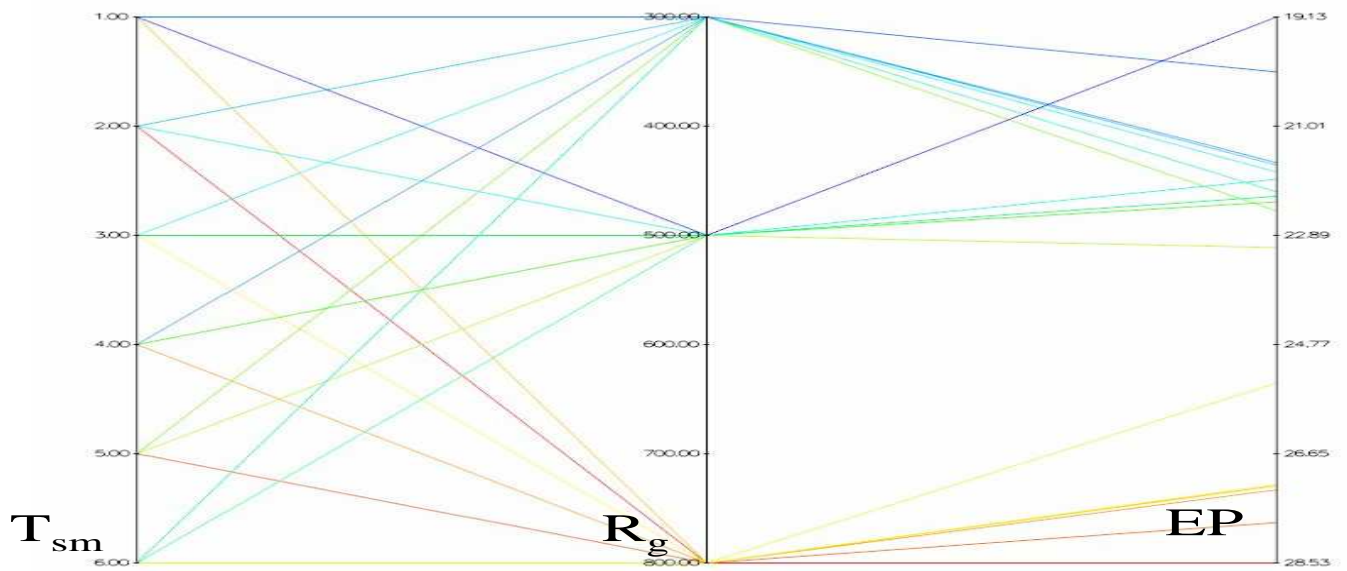Figure J.1: Influence of $R_g$ and $T_{sm}$ on the EP objective for $N_G = 30$ (cont.)
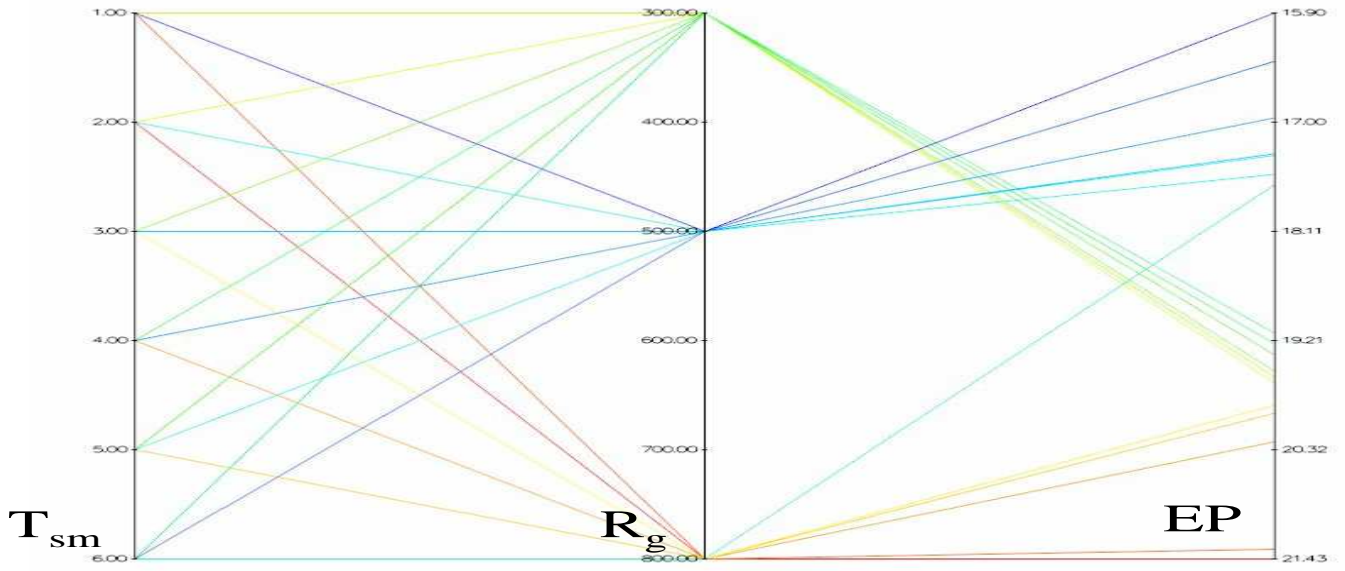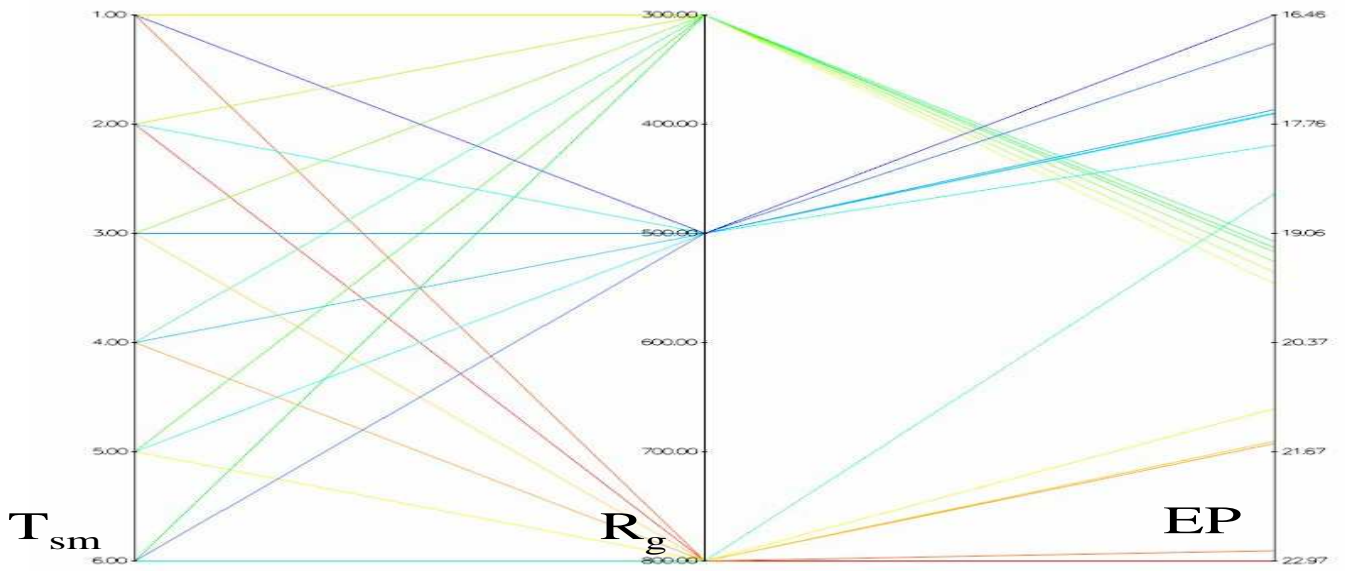
(a) EEMACOMP



(b) EEMACOMH

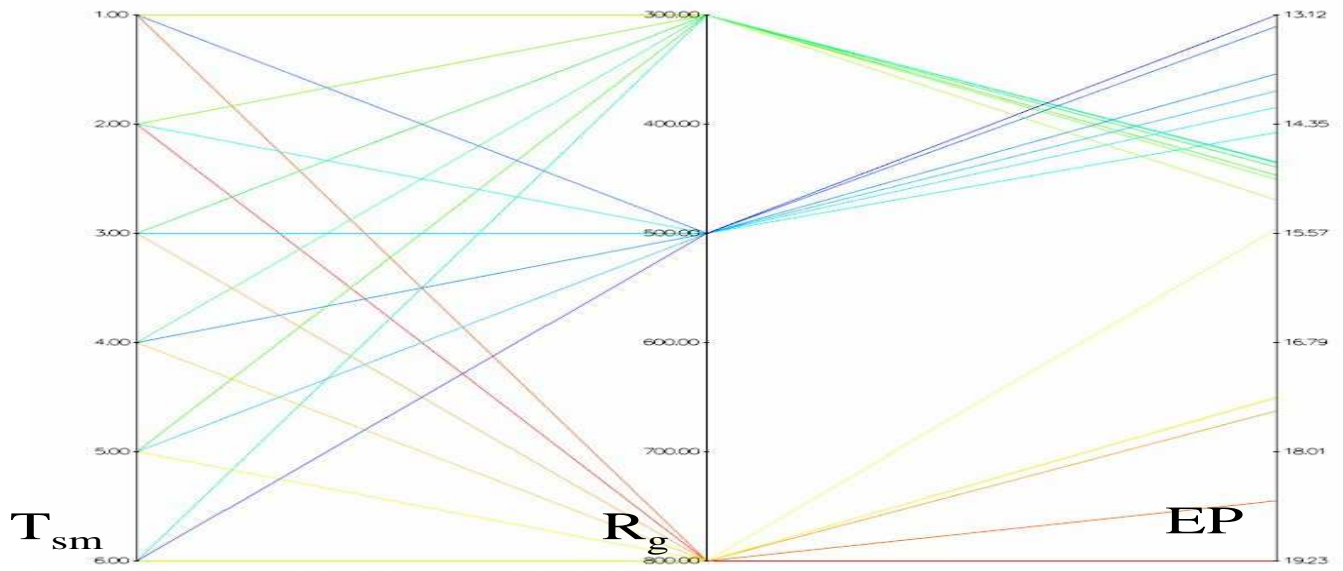Figure J.2: Influence of $R_g$ and $T_{sm}$ on the EP objective for $N_G = 100$
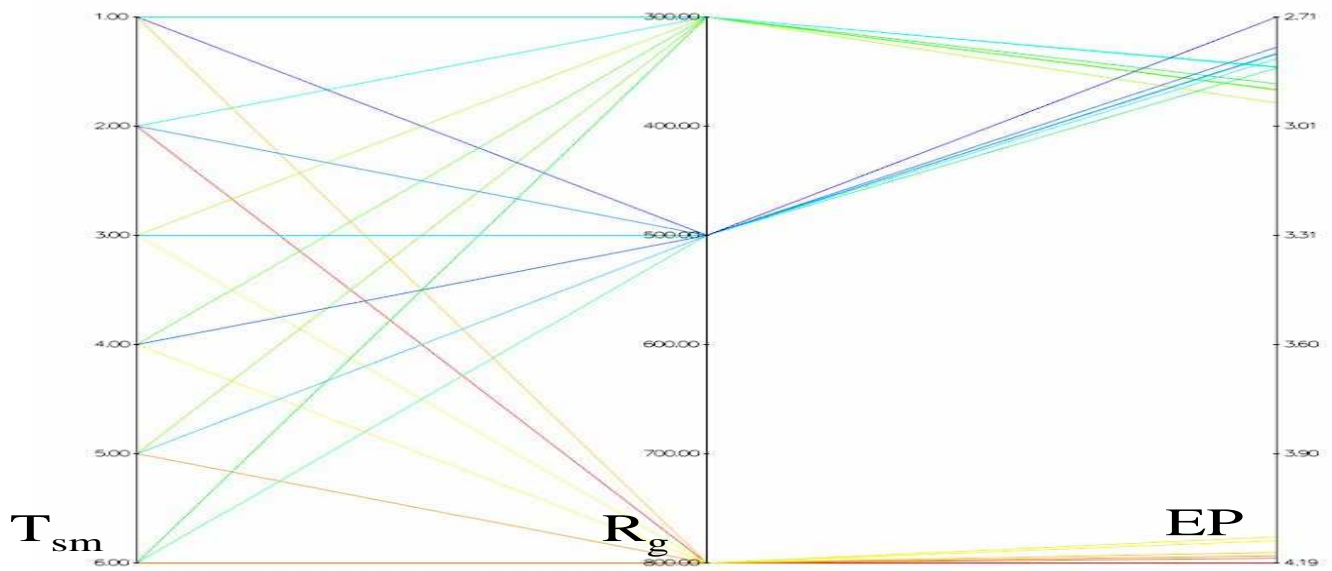
(c) EEMMASMP



(d) EEMMASMH

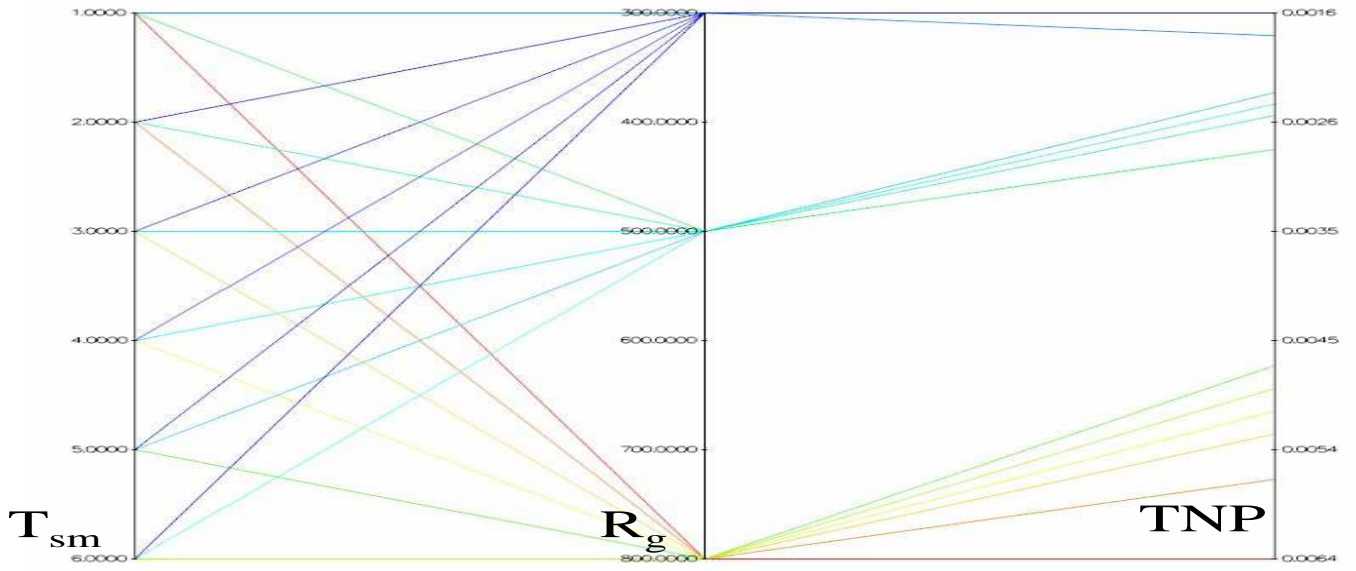Figure J.2: Influence of $R_g$ and $T_{sm}$ on the EP objective for $N_G = 100$ (cont.)
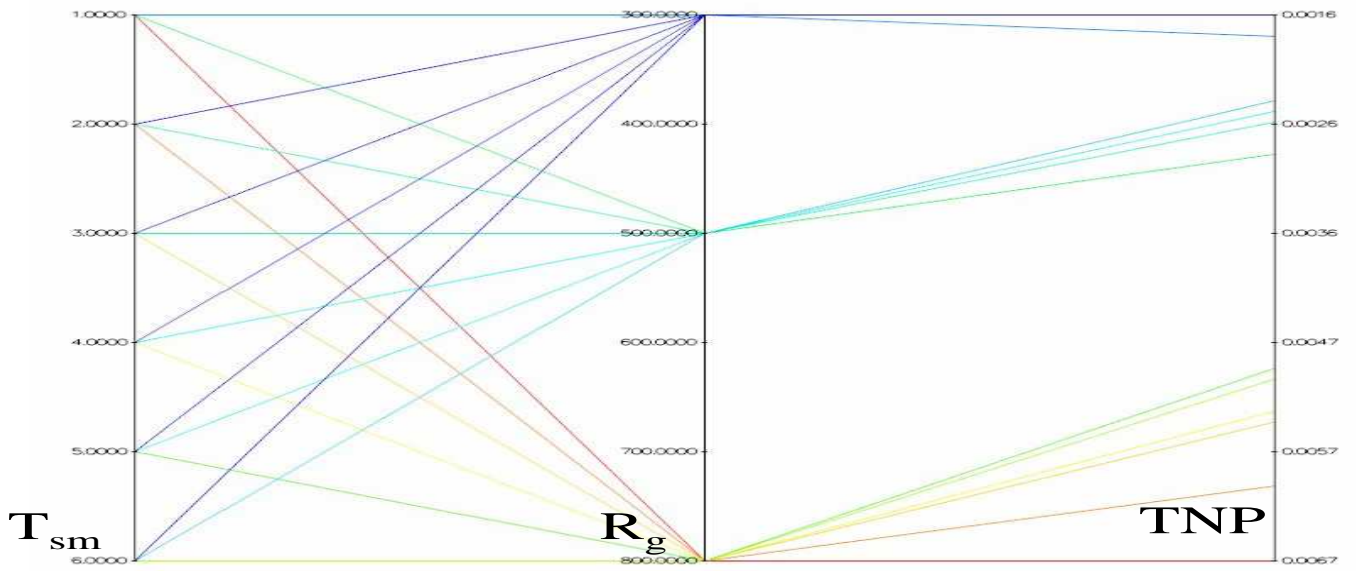
(e) EEMACOMC



(f) NSGA-II-MPA

Figure J.2: Influence of $R_g$ and $T_{sm}$ on the EP objective for $N_G = 100$ (cont.)
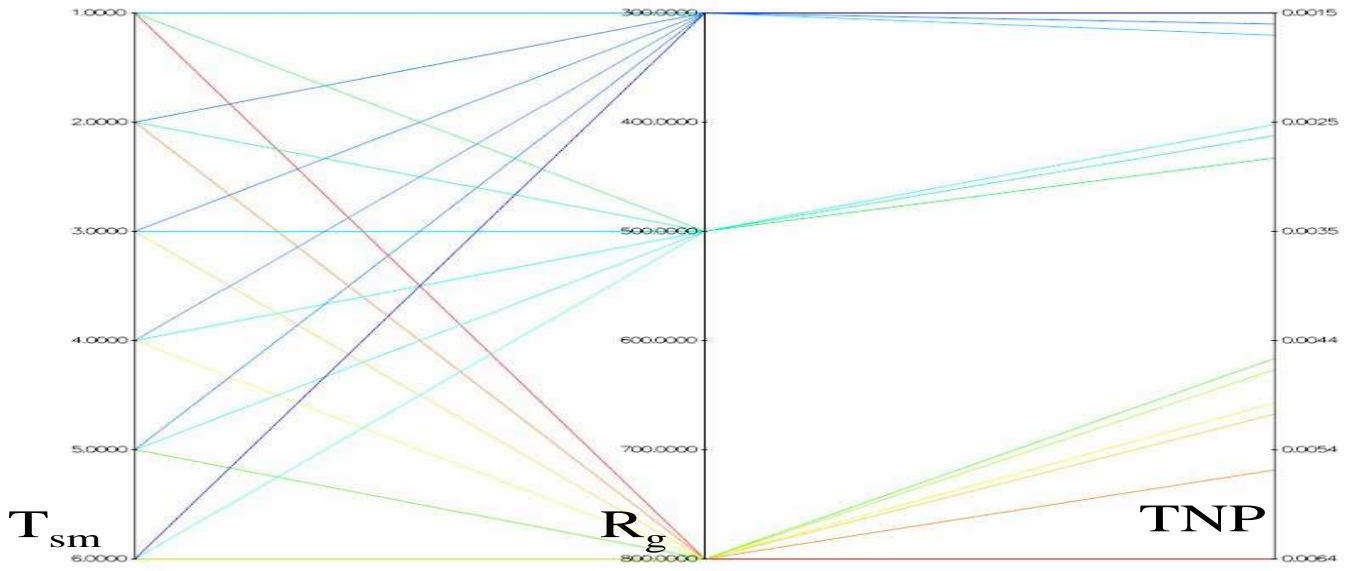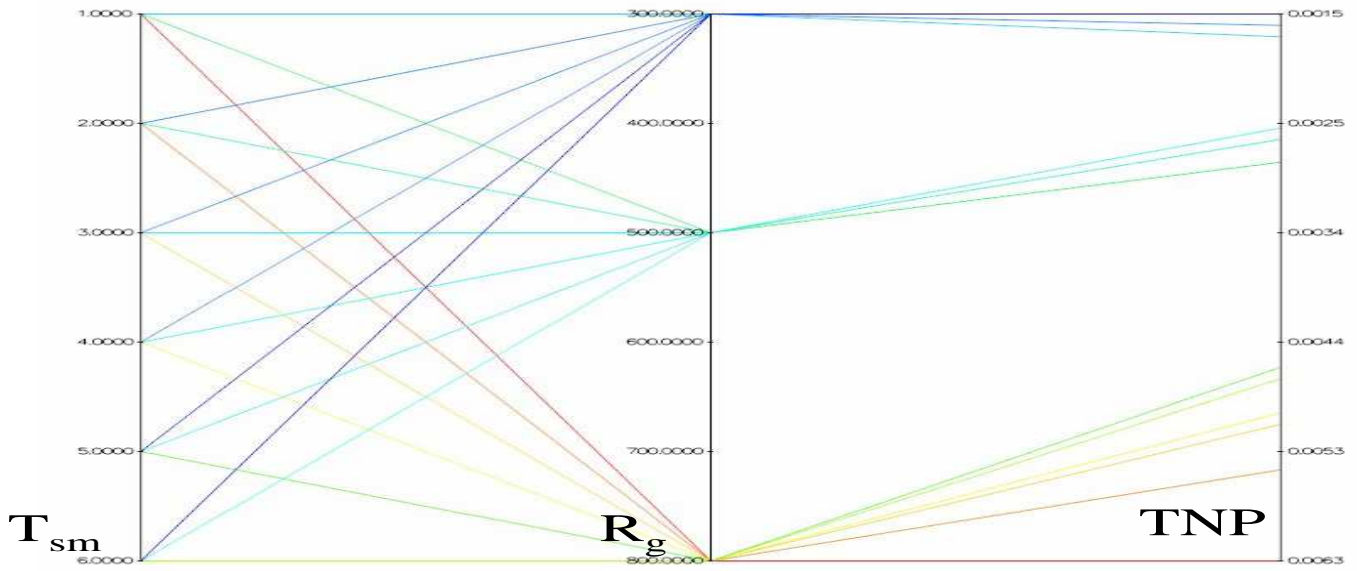
(a) EEMACOMP



(b) EEMACOMH

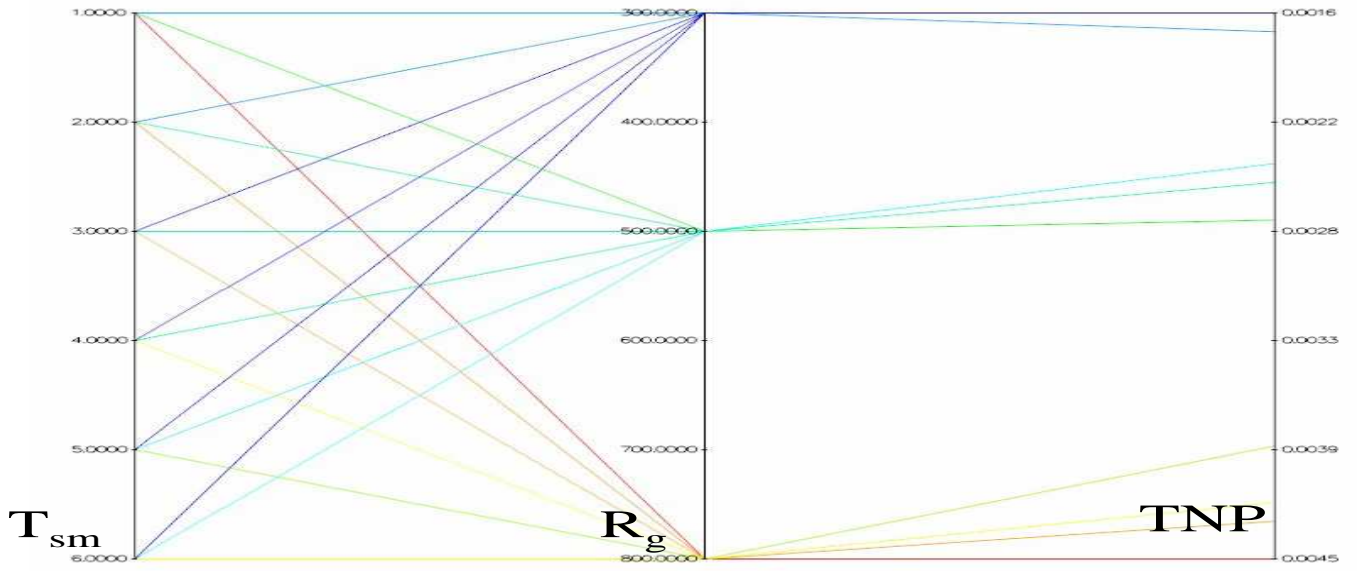Figure J.3: Influence of $R_g$ and $T_{sm}$ on the EP objective for $N_G = 300$
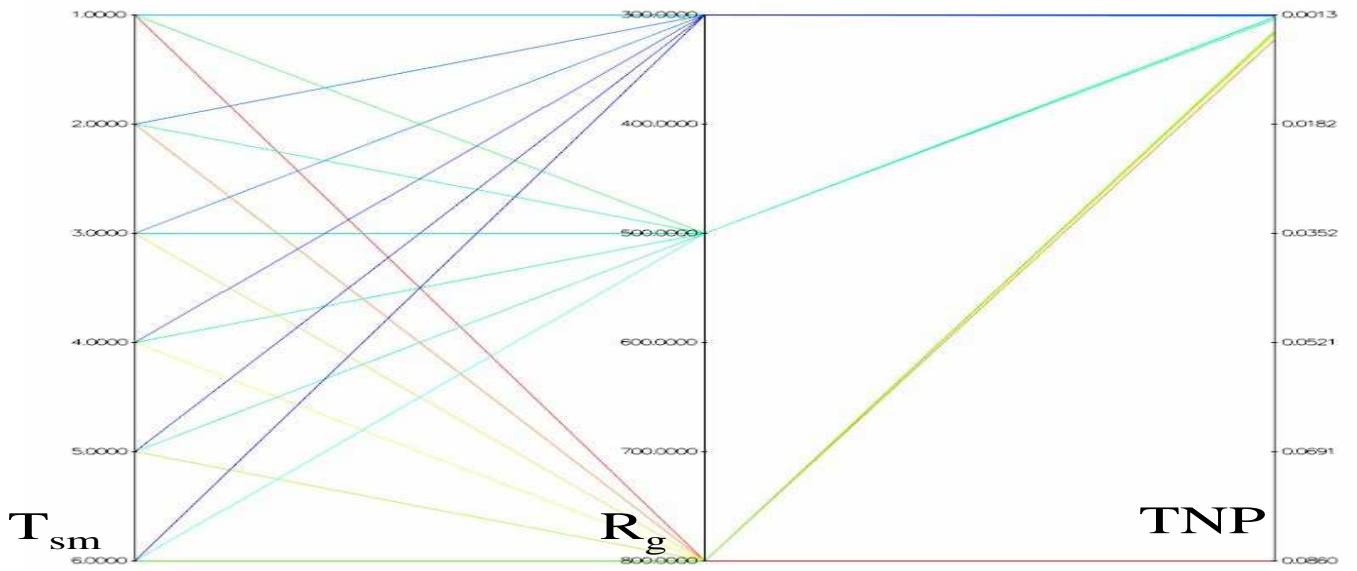
(c) EEMMASMP



(d) EEMMASMH

Figure J.3: Influence of $R_g$ and $T_{sm}$ on the EP objective for $N_G = 300$ (cont.)
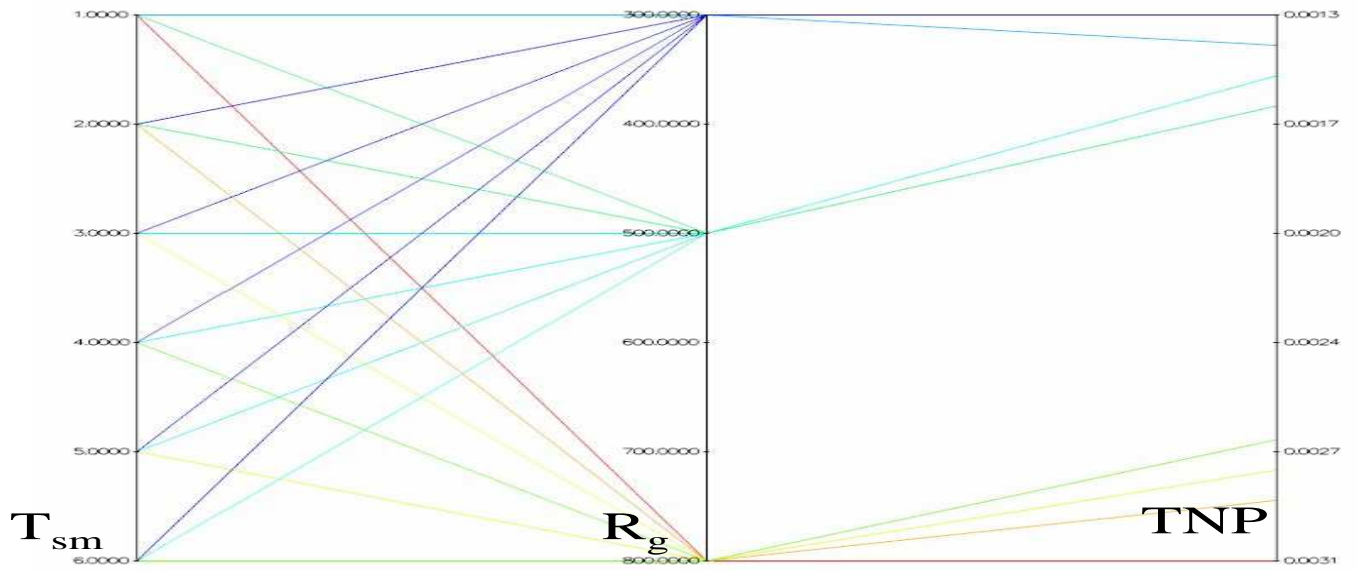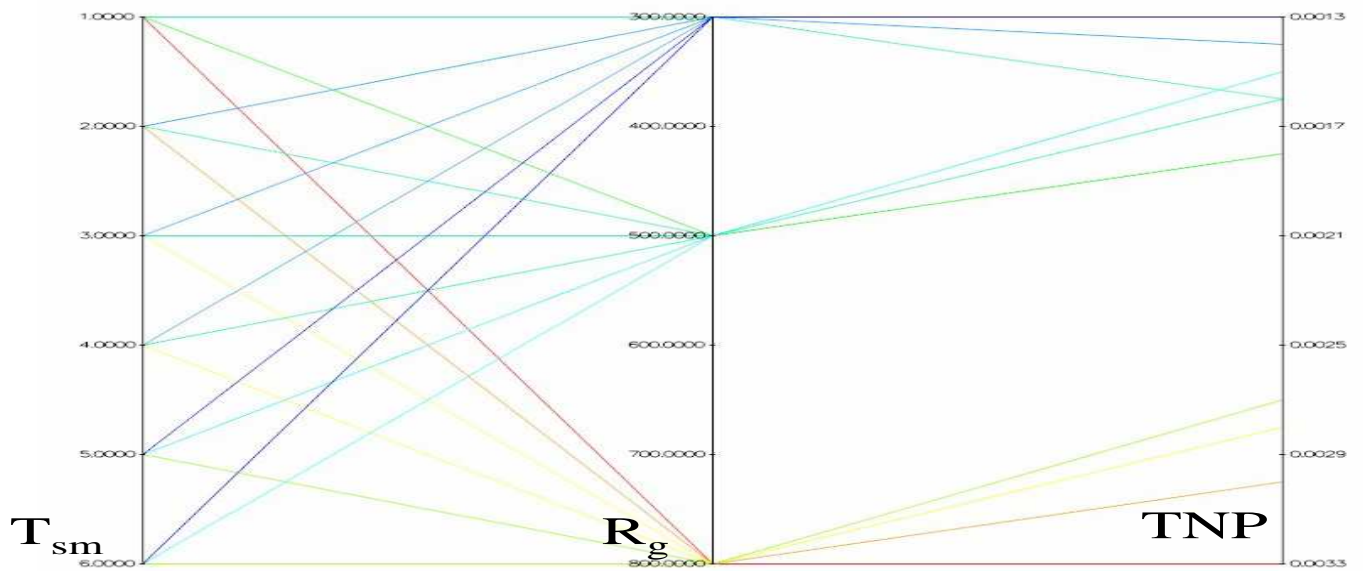
(e) EEMACOMC



(f) NSGA-II-MPA

Figure J.3: Influence of $R_g$ and $T_{sm}$ on the EP objective for $N_G = 300$ (cont.)
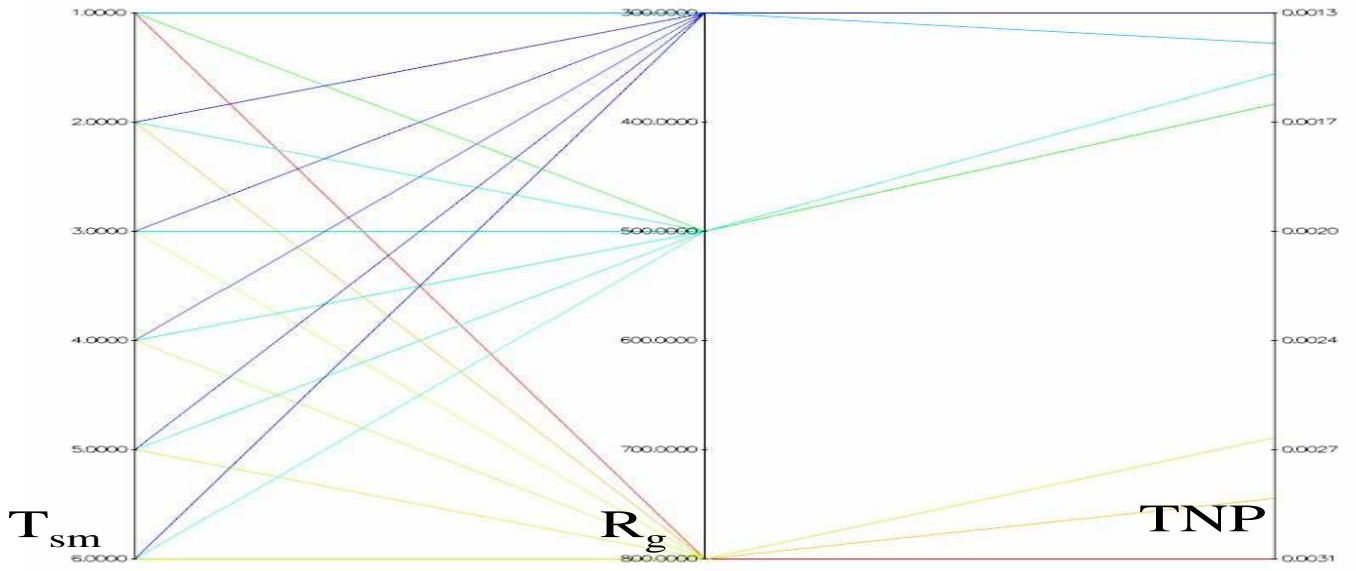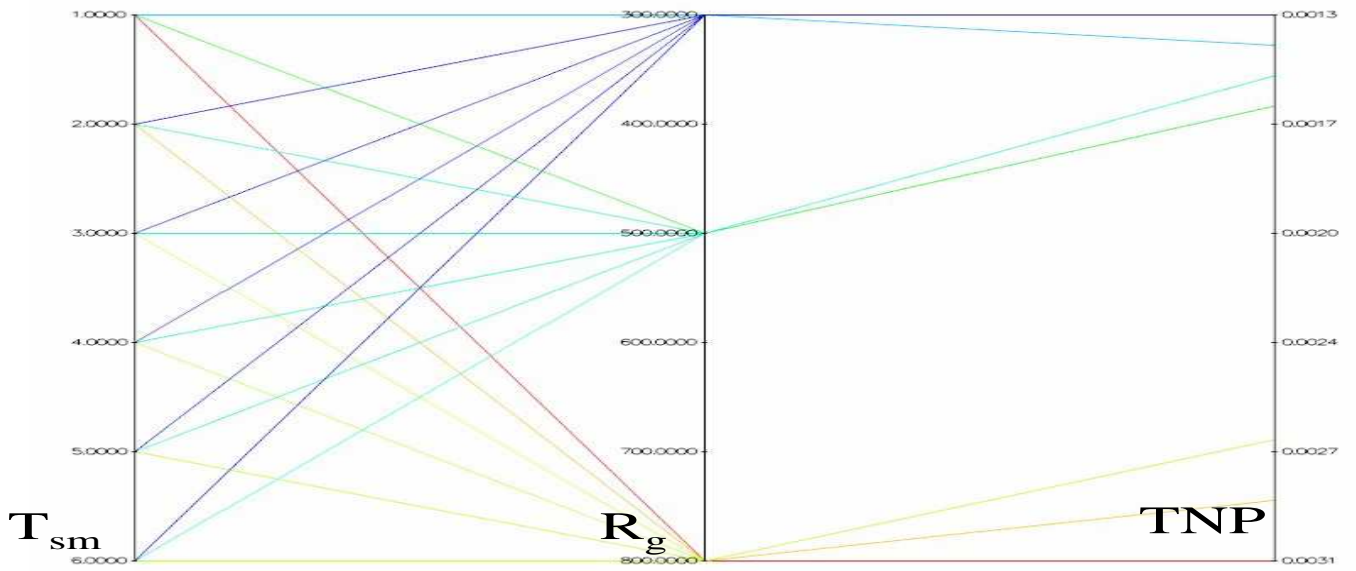
(a) EEMACOMP



(b) EEMACOMH

Figure J.4: Influence of $R_g$ and $T_{sm}$ on the TNP objective for $N_G = 30$
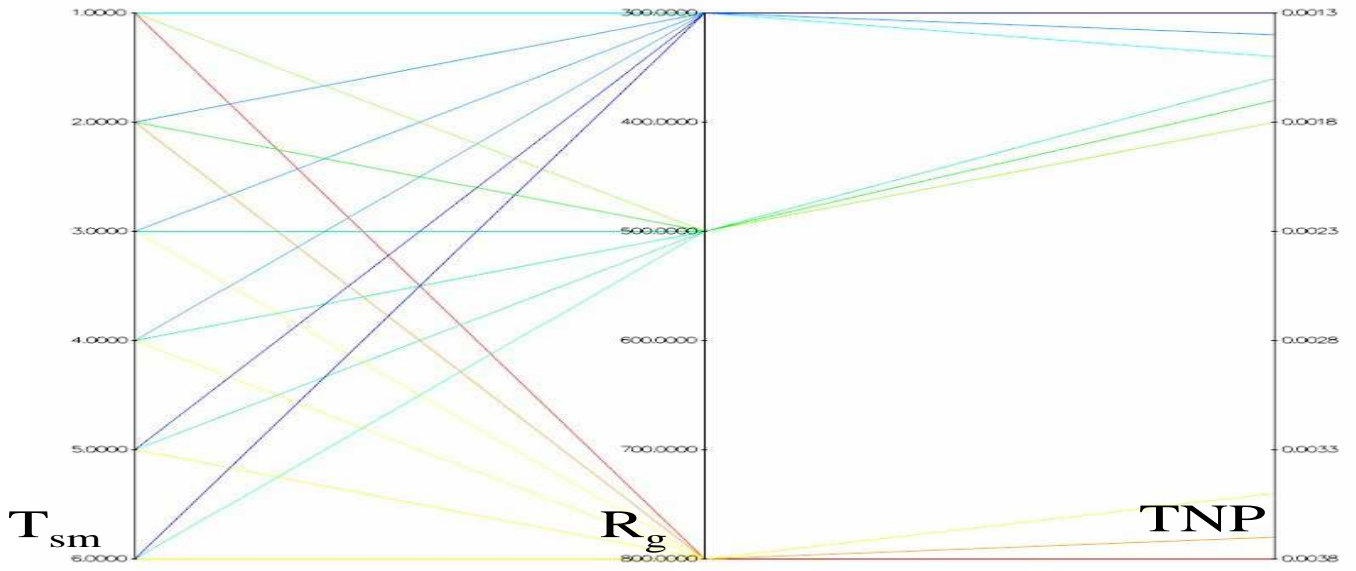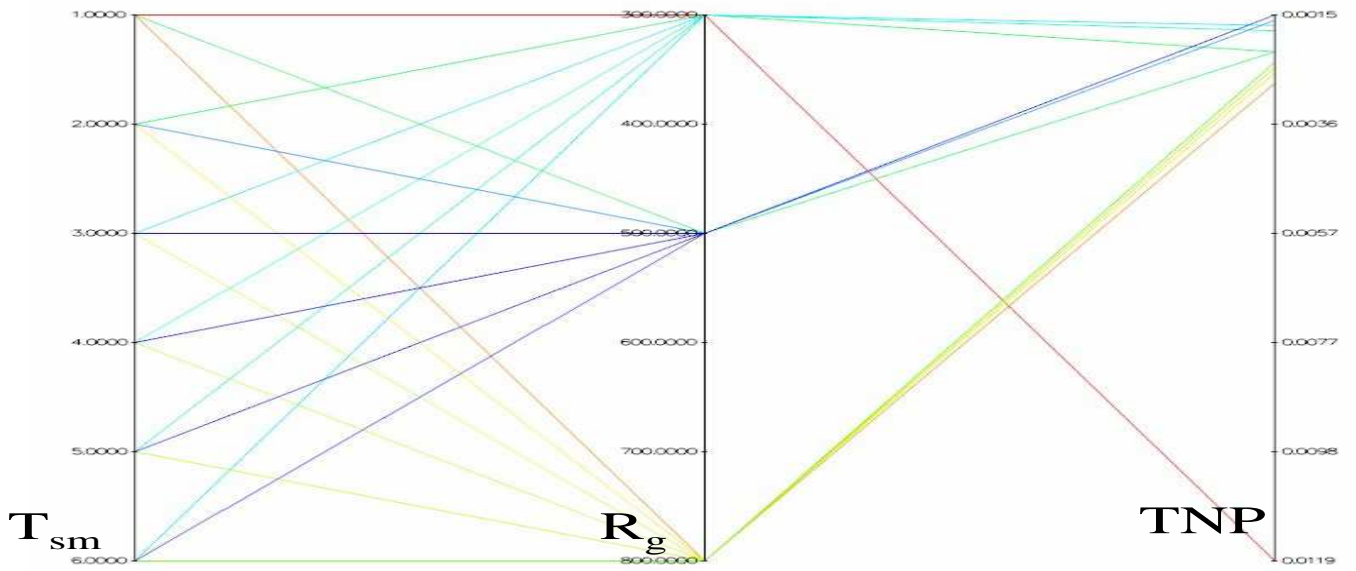
(c) EEMMASMP



(d) EEMMASMH

Figure J.4: Influence of $R_g$ and $T_{sm}$ on the TNP objective for $N_G = 30$ (cont.)
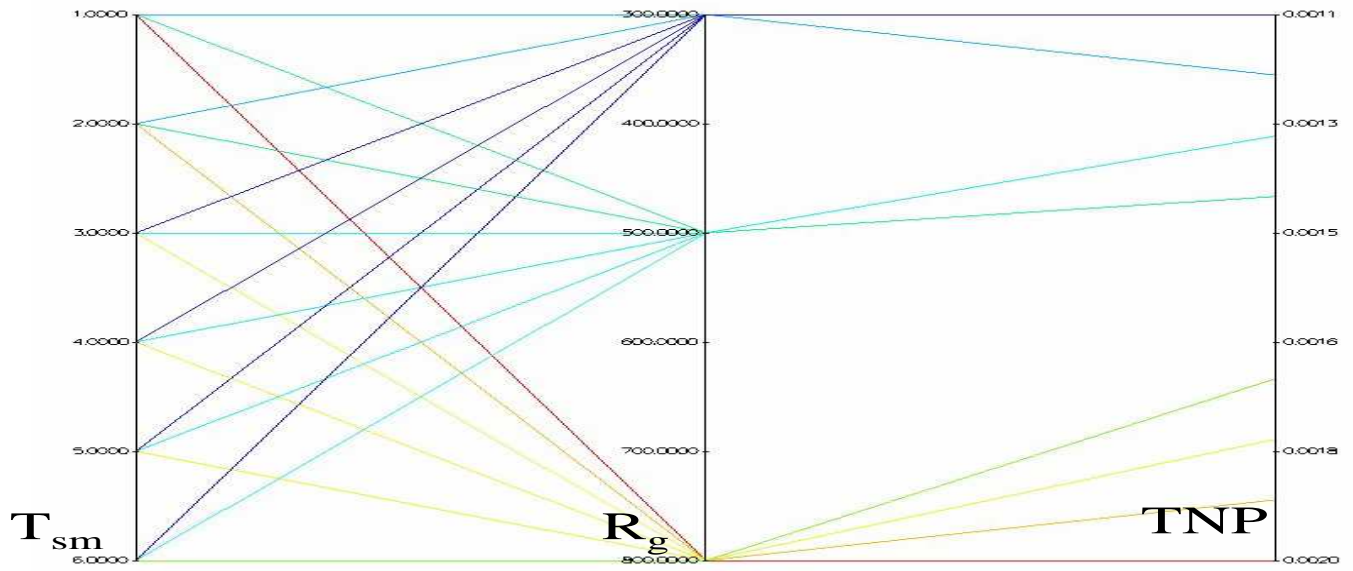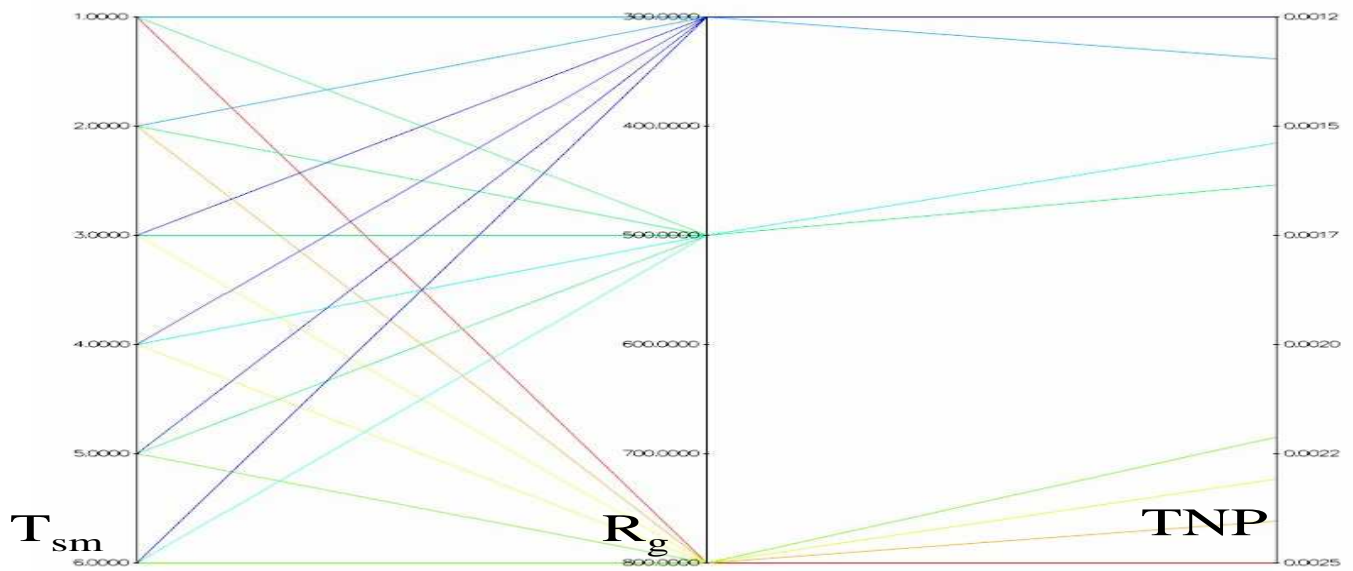
(e) EEMACOMC



(f) NSGA-II-MPA

Figure J.4: Influence of $R_g$ and $T_{sm}$ on the TNP objective for $N_G = 30$ (cont.)
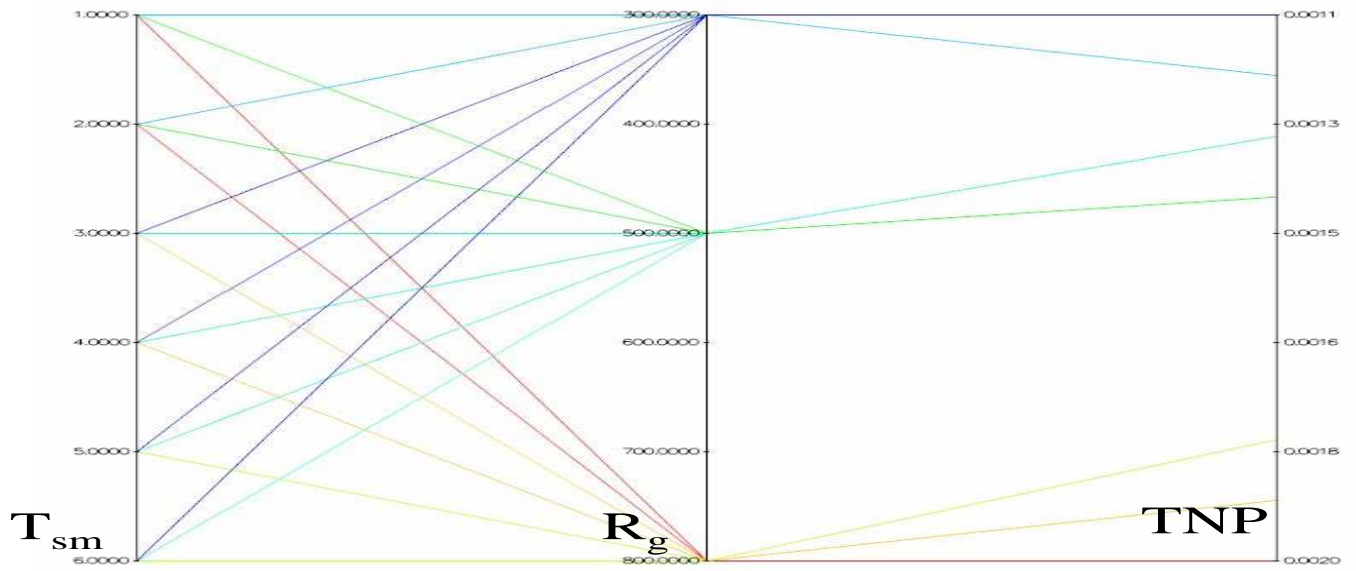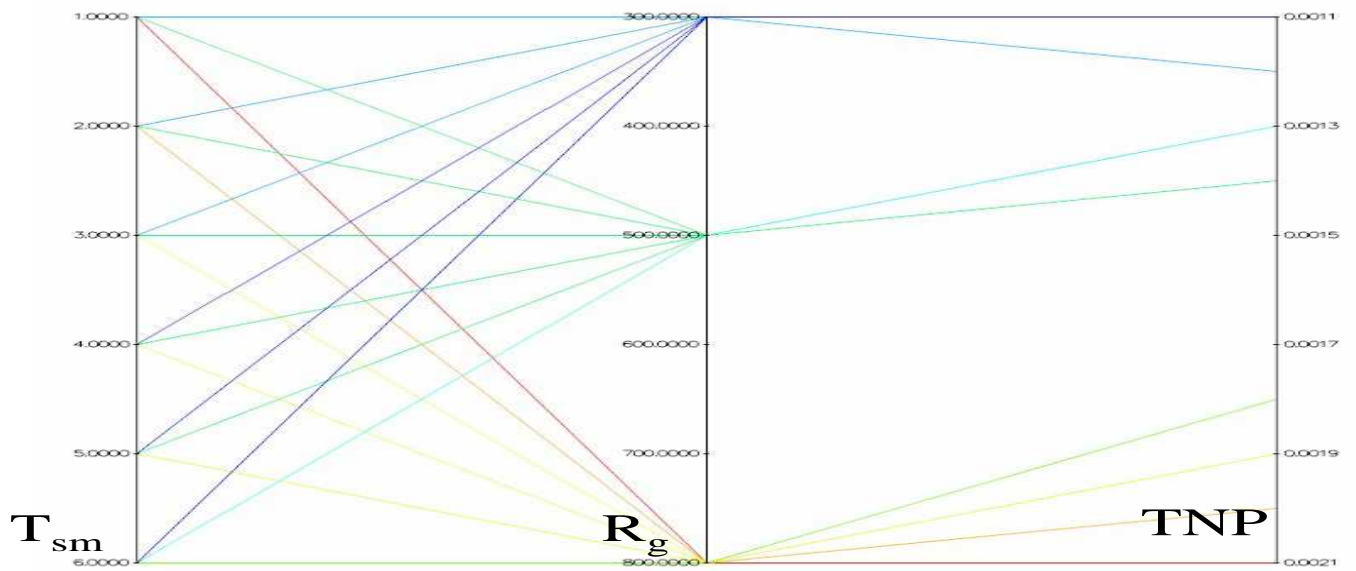
(a) EEMACOMP



(b) EEMACOMH

Figure J.5: Influence of $R_g$ and $T_{sm}$ on the TNP objective for $N_G = 100$

(c) EEMMASMP



(d) EEMMASMH

Figure J.5: Influence of $R_g$ and $T_{sm}$ on the TNP objective for $N_G = 100$ (cont.)

(e) EEMACOMC



(f) NSGA-II-MPA

Figure J.5: Influence of $R_g$ and $T_{sm}$ on the TNP objective for $N_G = 100$ (cont.)

(a) EEMACOMP



(b) EEMACOMH

Figure J.6: Influence of $R_g$ and $T_{sm}$ on the TNP objective for $N_G = 300$
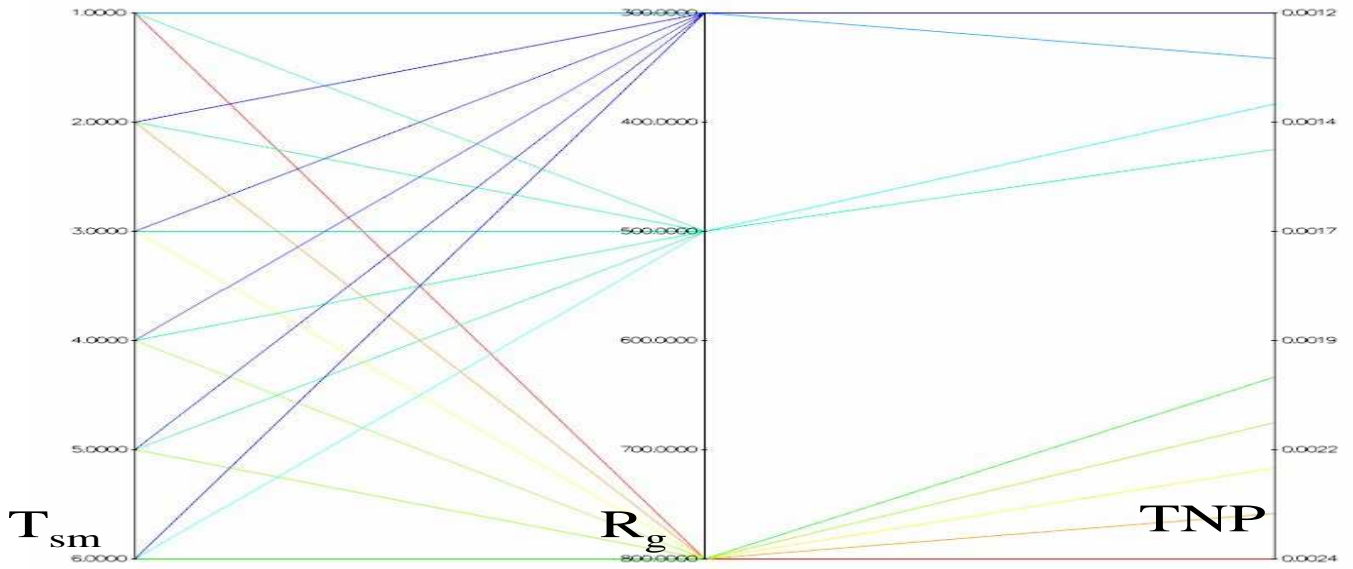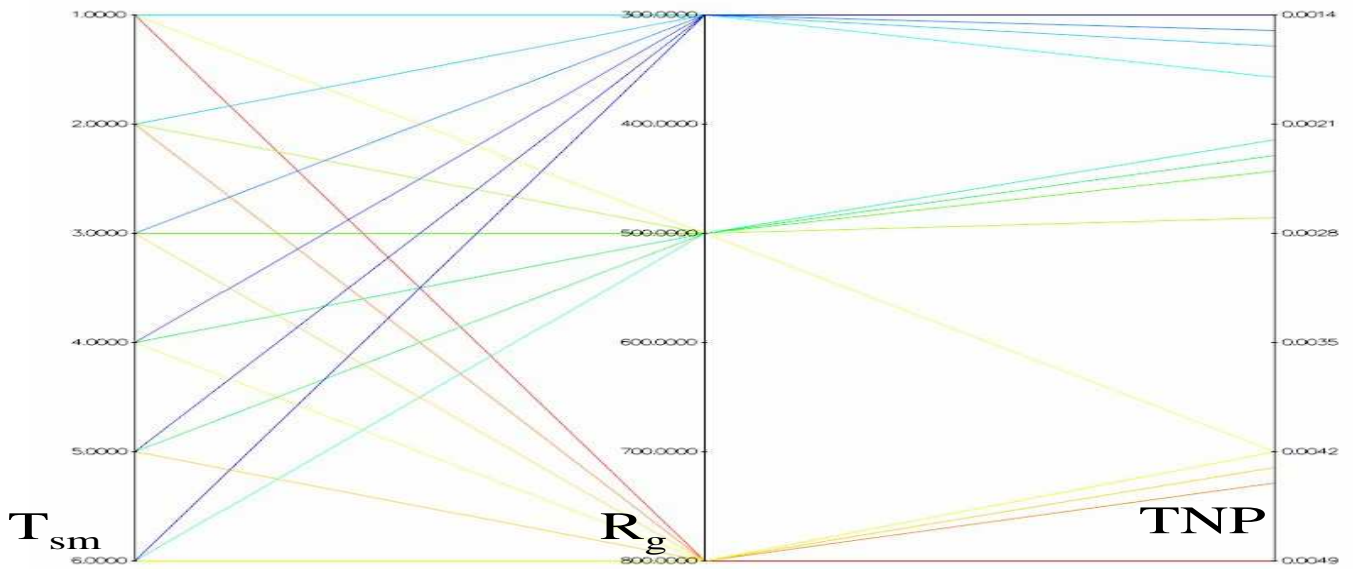
(c) EEMMASMP



(d) EEMMASMH

Figure J.6: Influence of $R_g$ and $T_{sm}$ on the TNP objective for $N_G = 300$ (cont.)
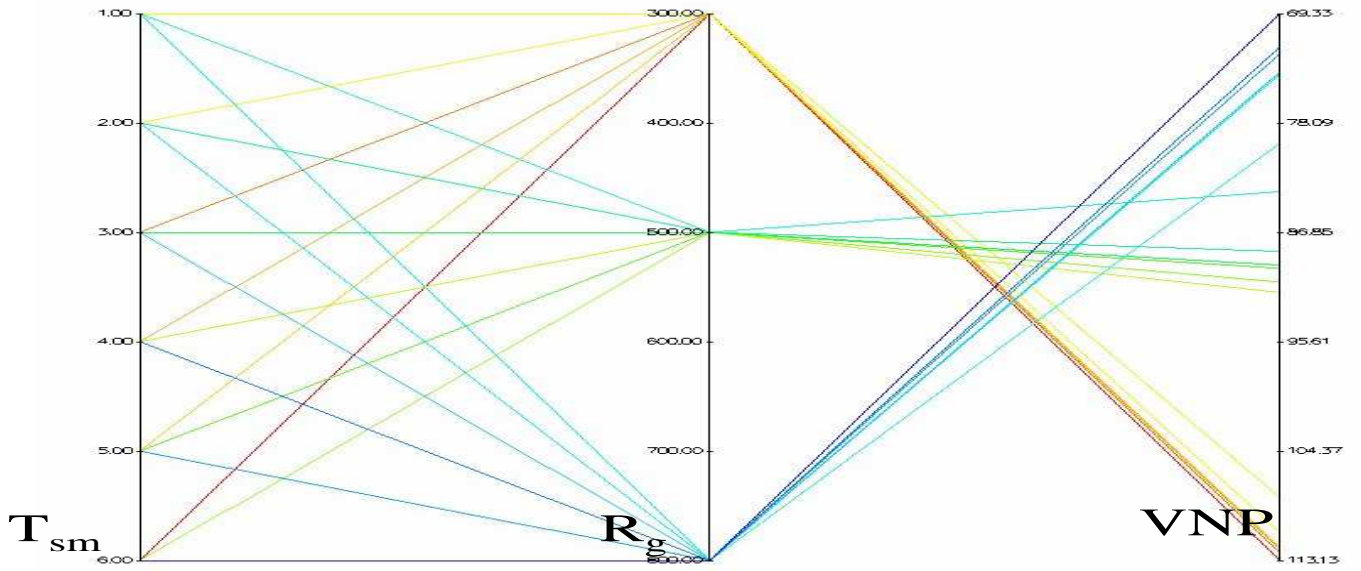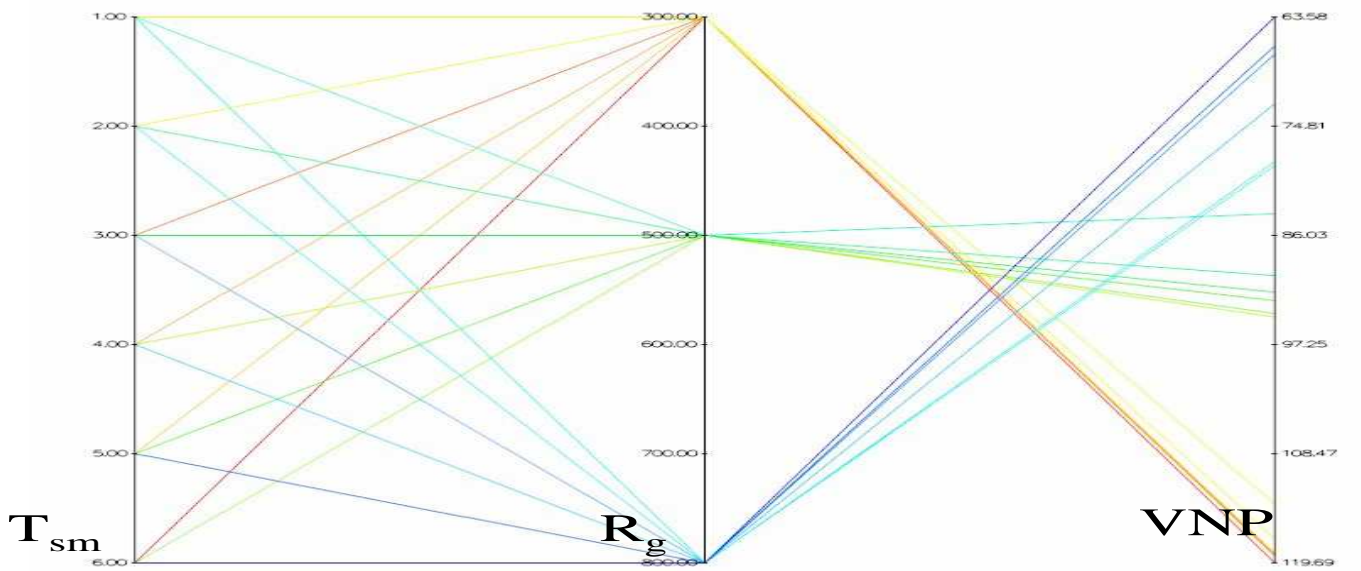
(e) EEMACOMC



(f) NSGA-II-MPA

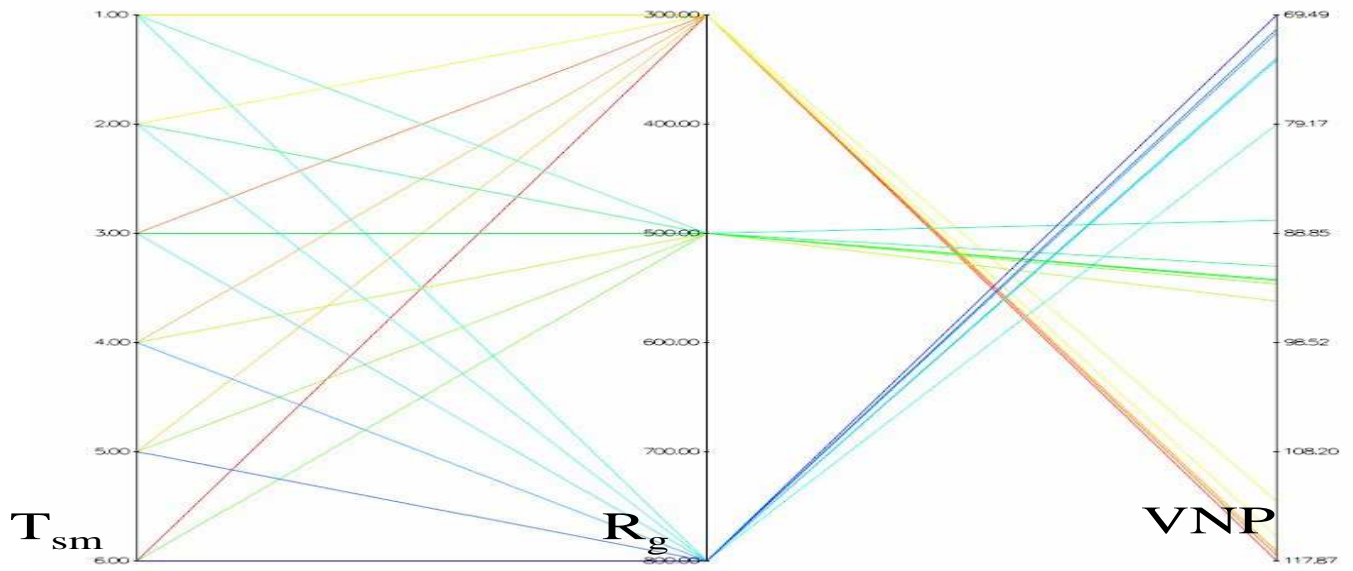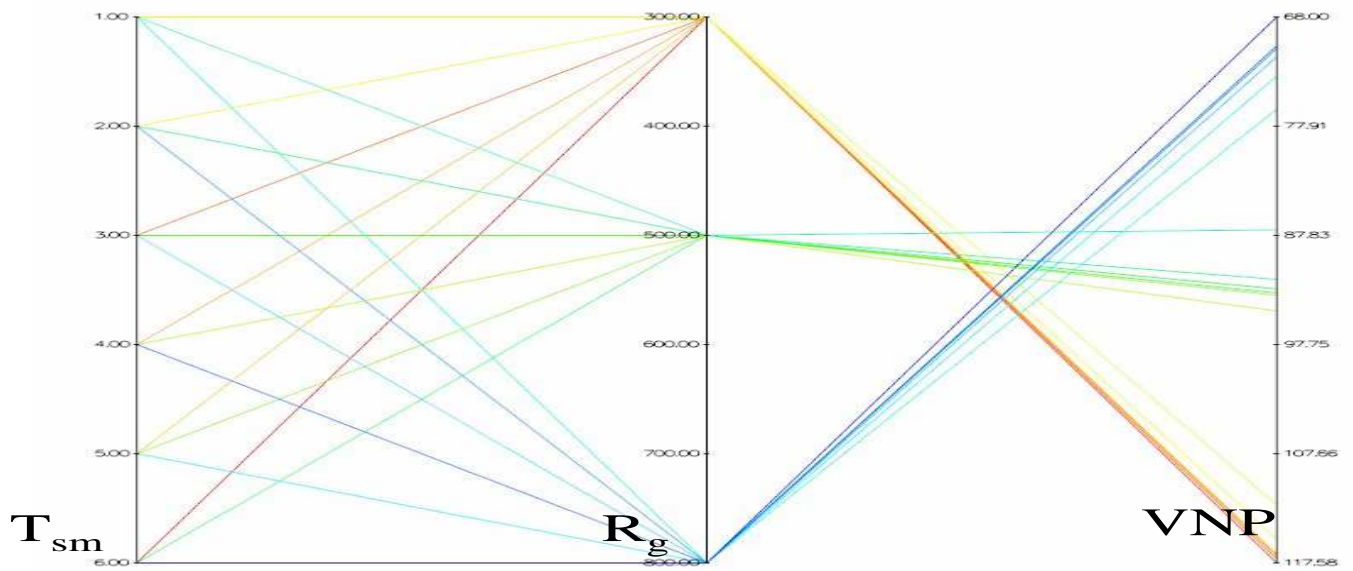Figure J.6: Influence of $R_g$ and $T_{sm}$ on the TNP objective for $N_G = 300$ (cont.)

(a) EEMACOMP



(b) EEMACOMH

Figure J.7: Influence of $R_g$ and $T_{sm}$ on the VNP objective for $N_G = 30$
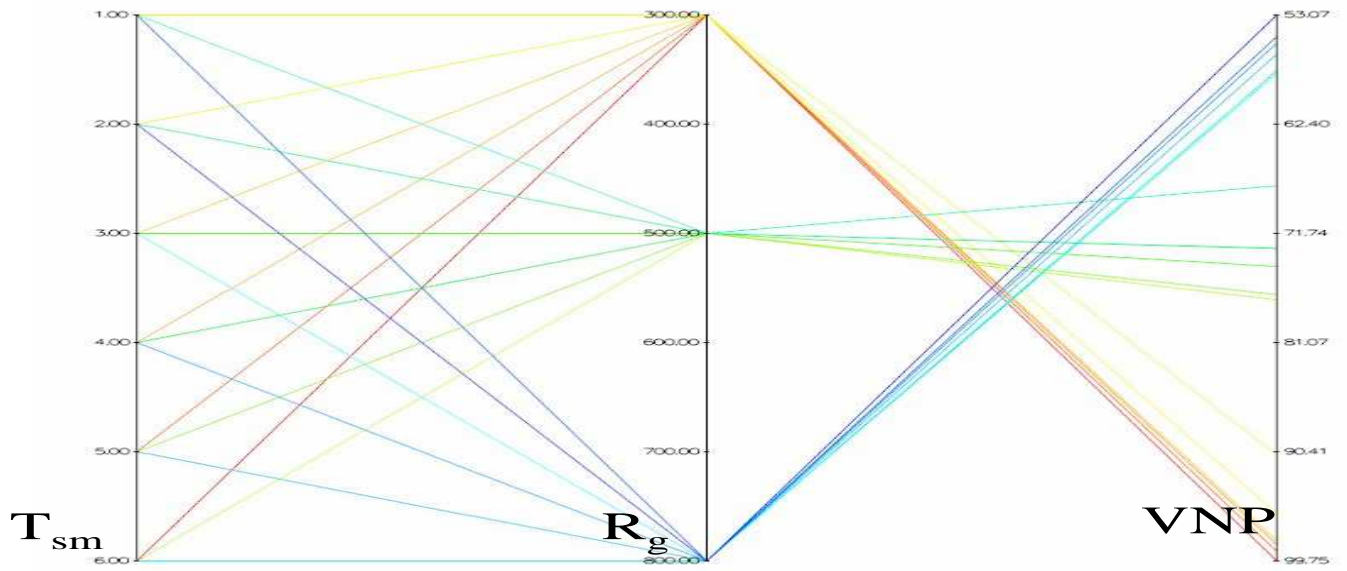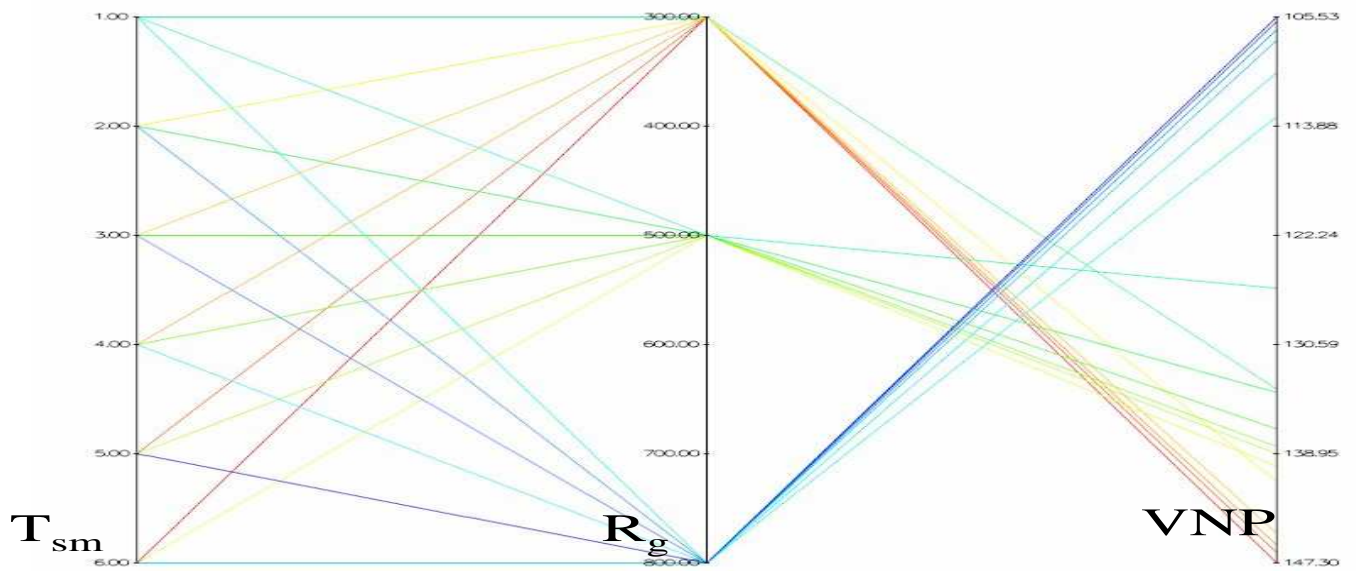
(c) EEMMASMP



(d) EEMMASMH

Figure J.7: Influence of $R_g$ and $T_{sm}$ on the VNP objective for $N_G = 30$ (cont.)
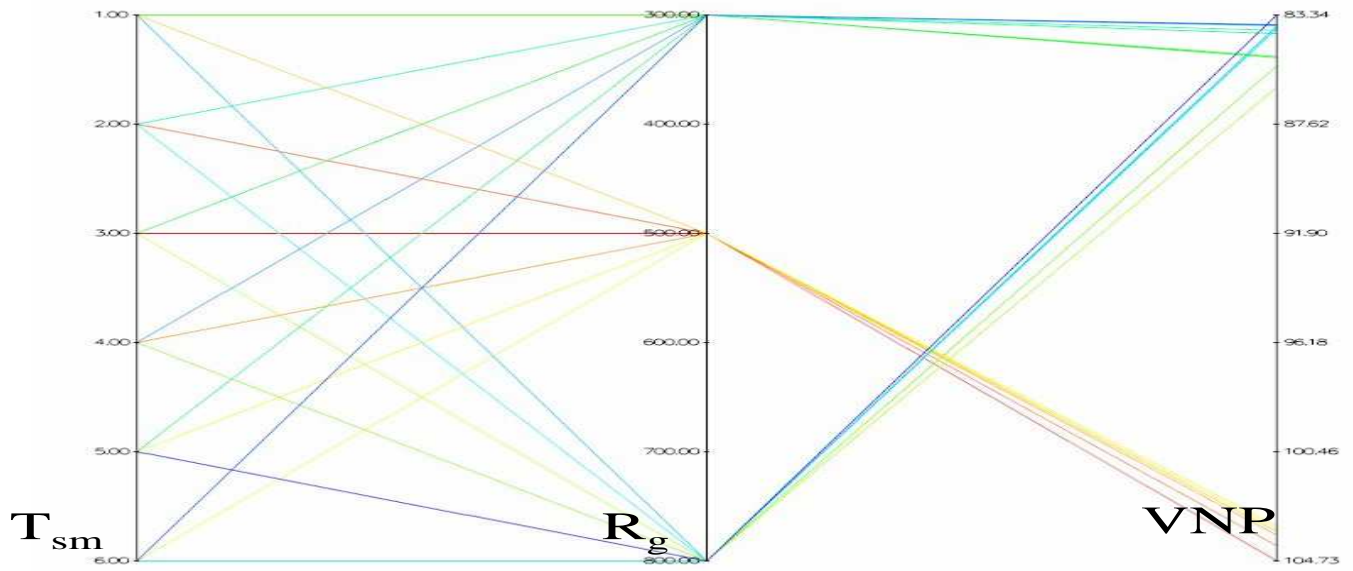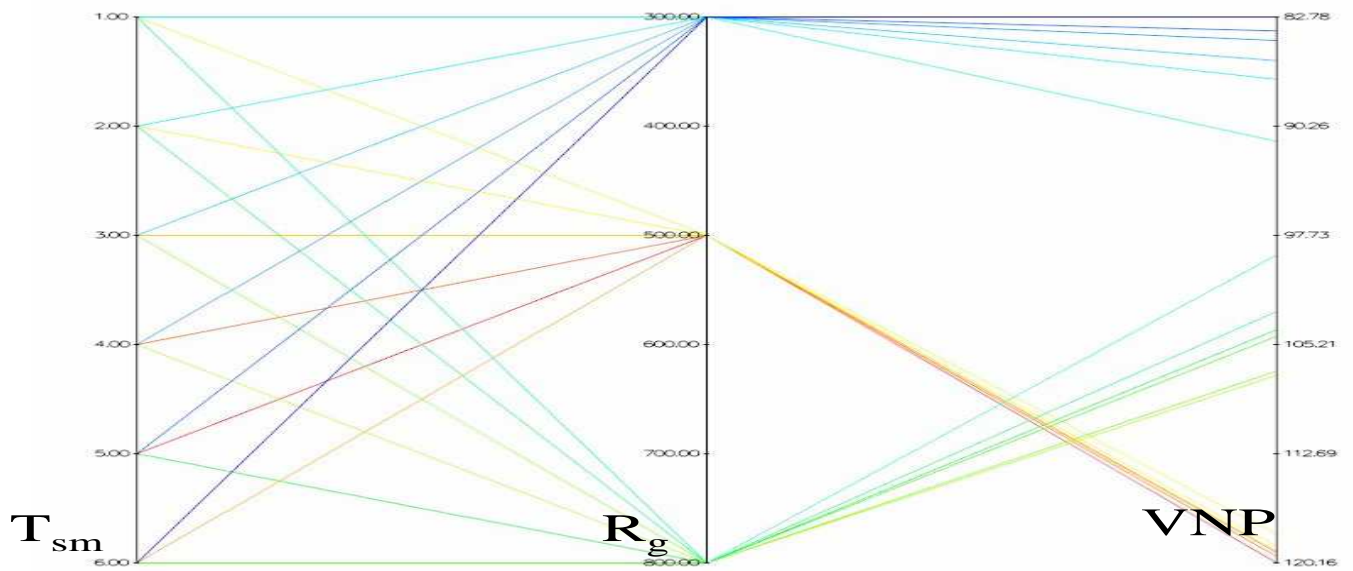
(e) EEMACOMC



(f) NSGA-II-MPA

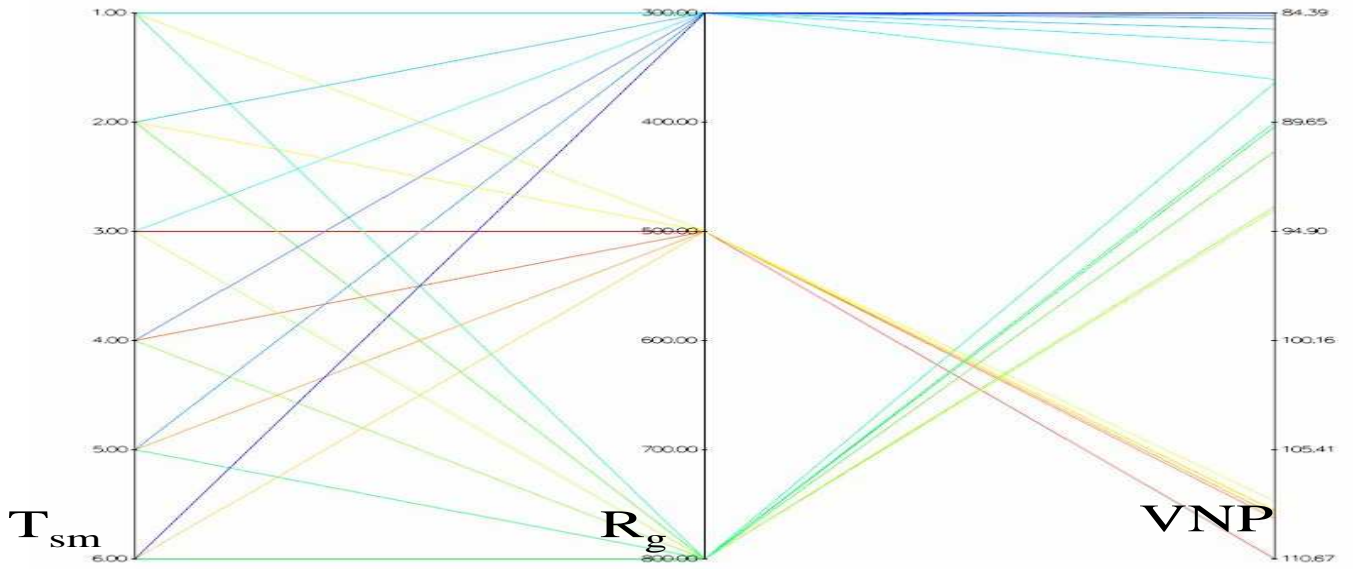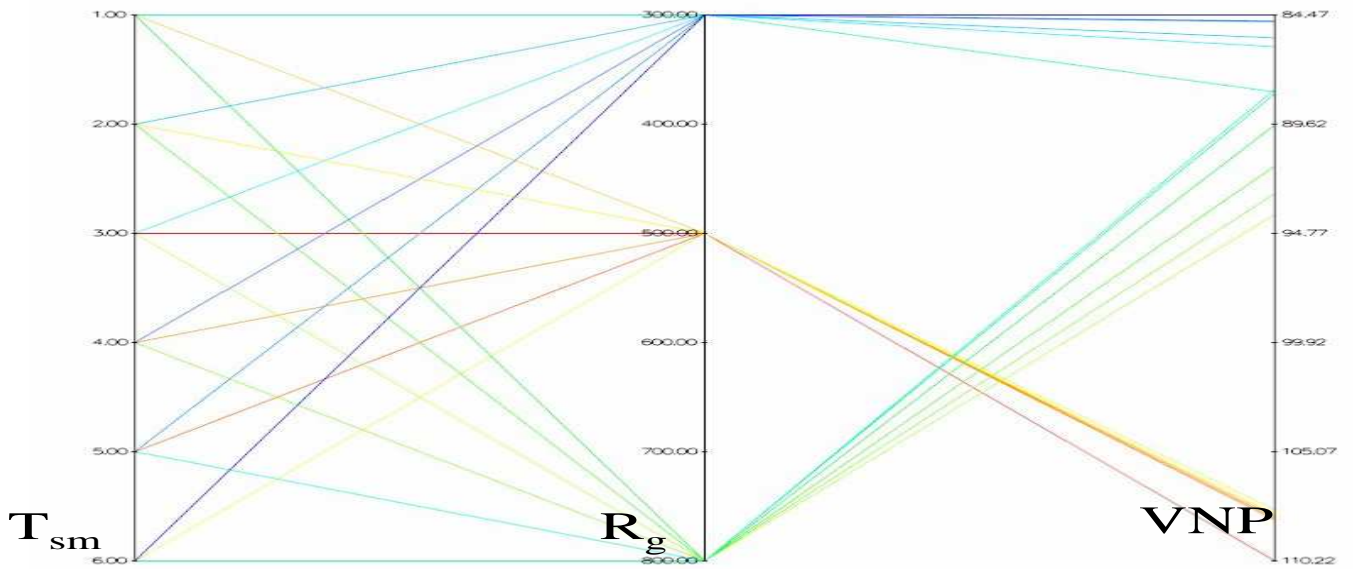Figure J.7: Influence of $R_g$ and $T_{sm}$ on the VNP objective for $N_G = 30$ (cont.)

(a) EEMACOMP



(b) EEMACOMH

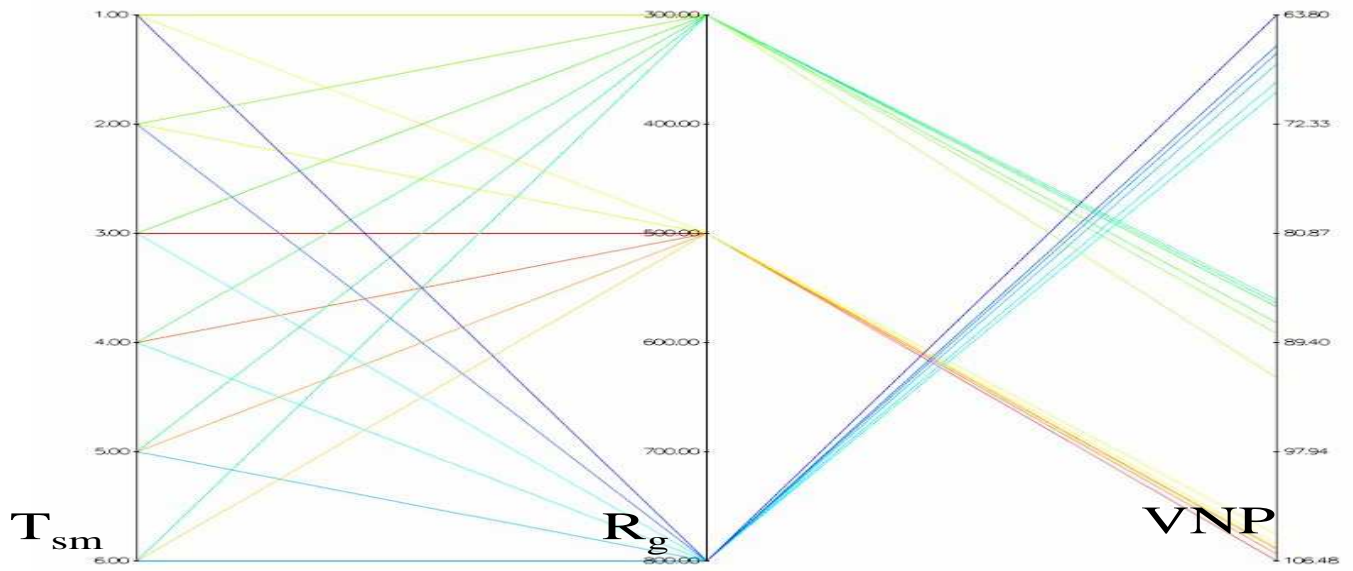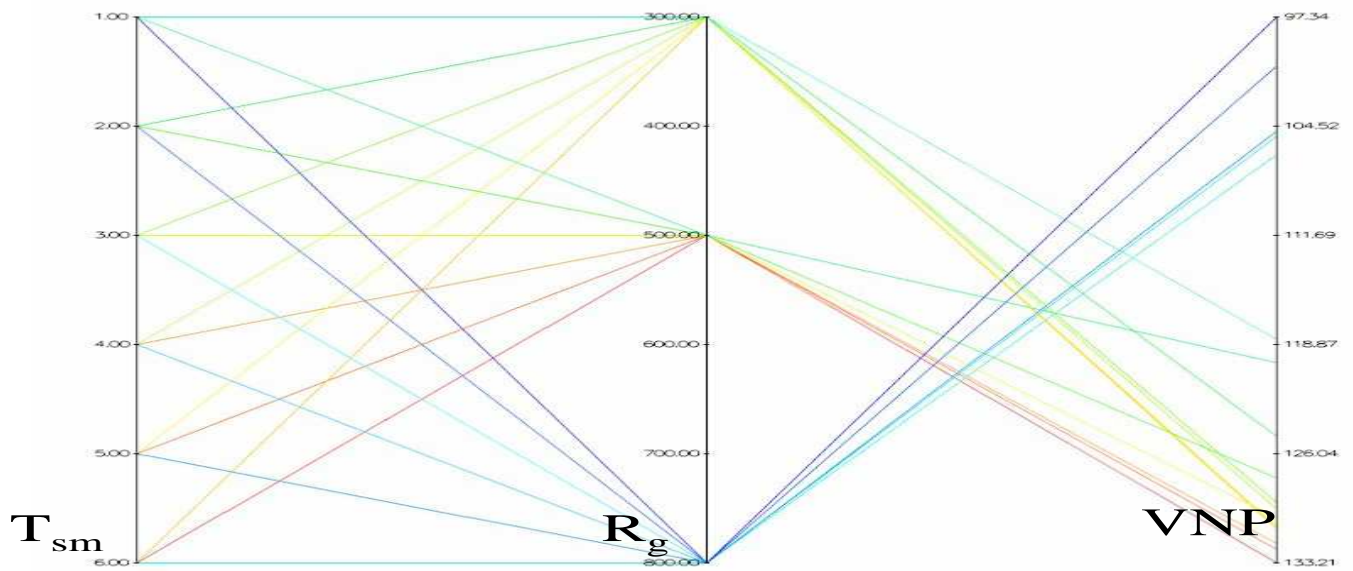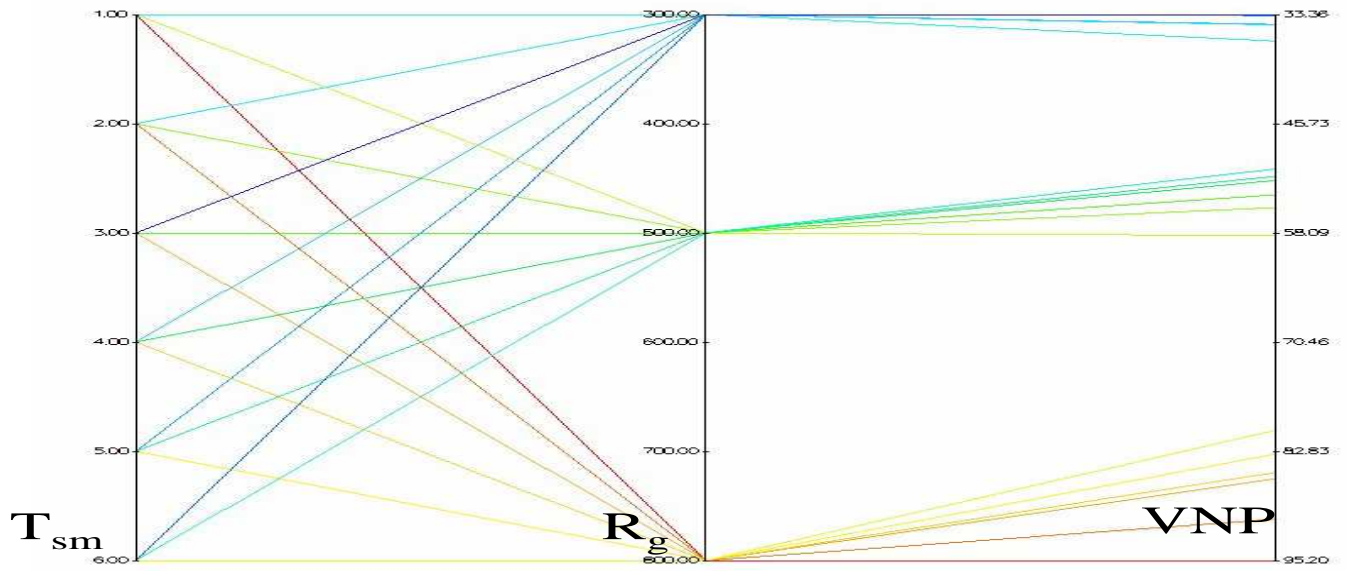Figure J.8: Influence of $R_g$ and $T_{sm}$ on the VNP objective for $N_G = 100$

435

(c) EEMMASMP



(d) EEMMASMH

Figure J.8: Influence of $R_g$ and $T_{sm}$ on the VNP objective for $N_G = 100$ (cont.)
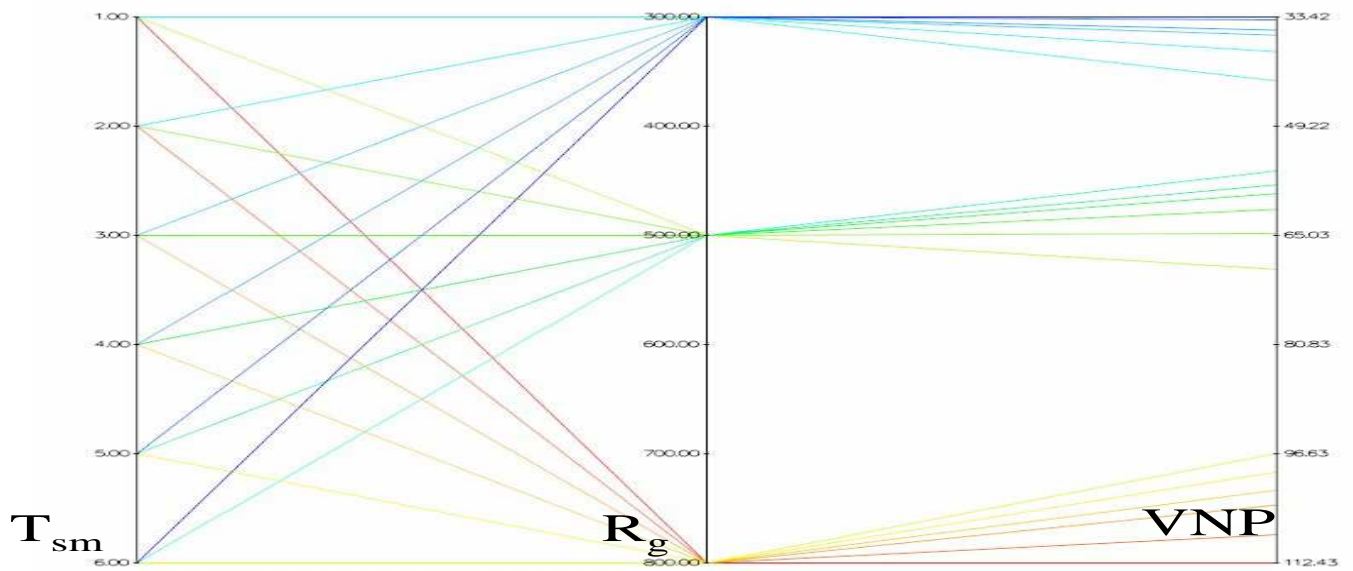
(e) EEMACOMC



(f) NSGA-II-MPA

Figure J.8: Influence of $R_g$ and $T_{sm}$ on the VNP objective for $N_G = 100$ (cont.)
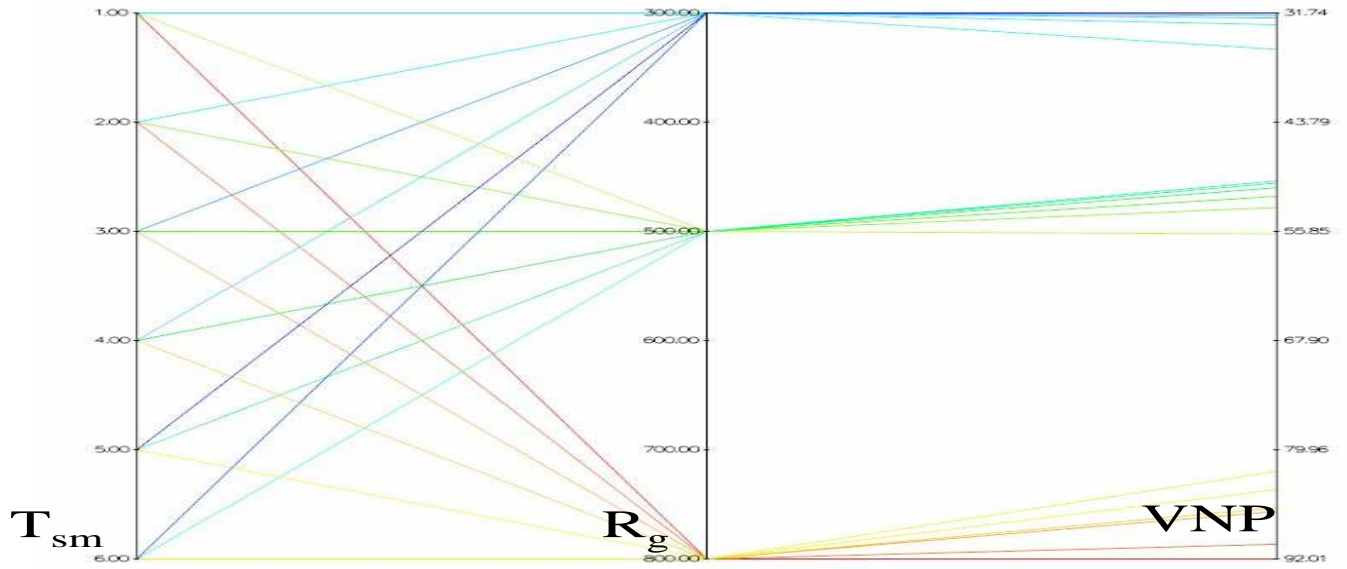
(a) EEMACOMP
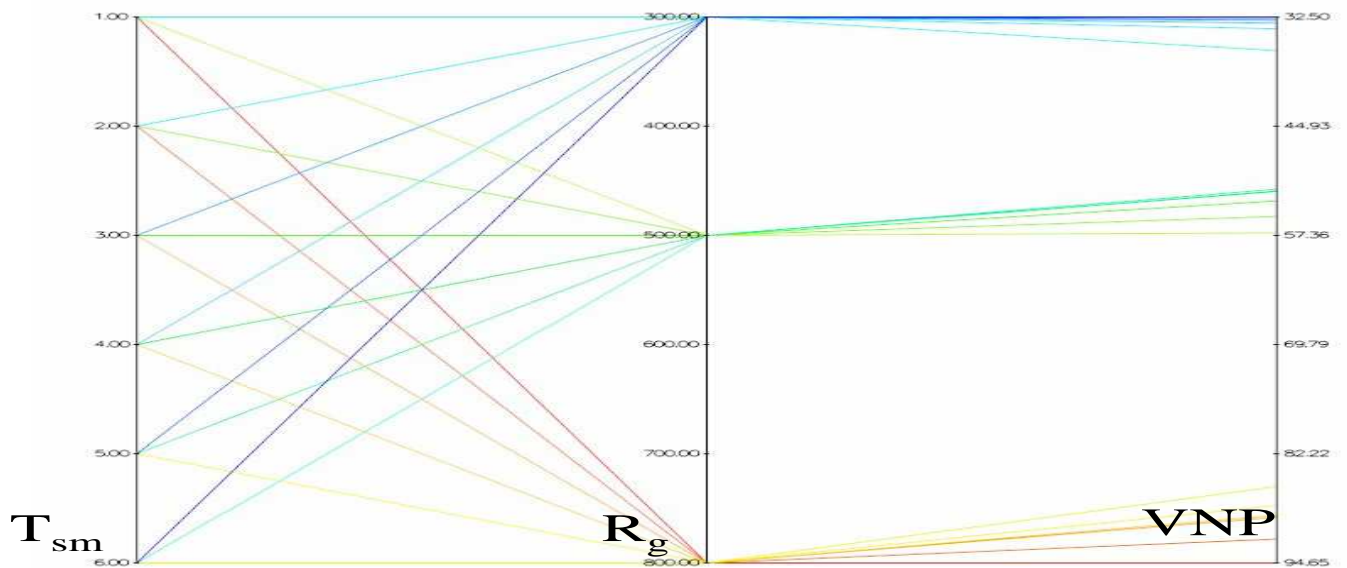


(b) EEMACOMH

Figure J.9: Influence of $R_g$ and $T_{sm}$ on the VNP objective for $N_G = 300$
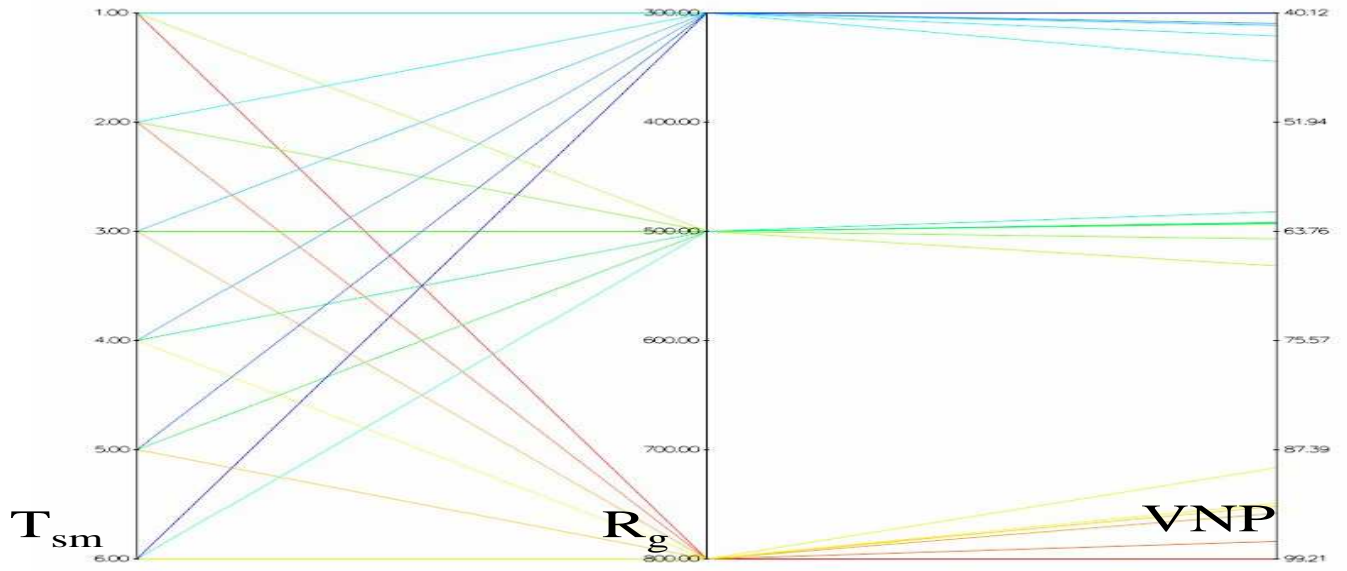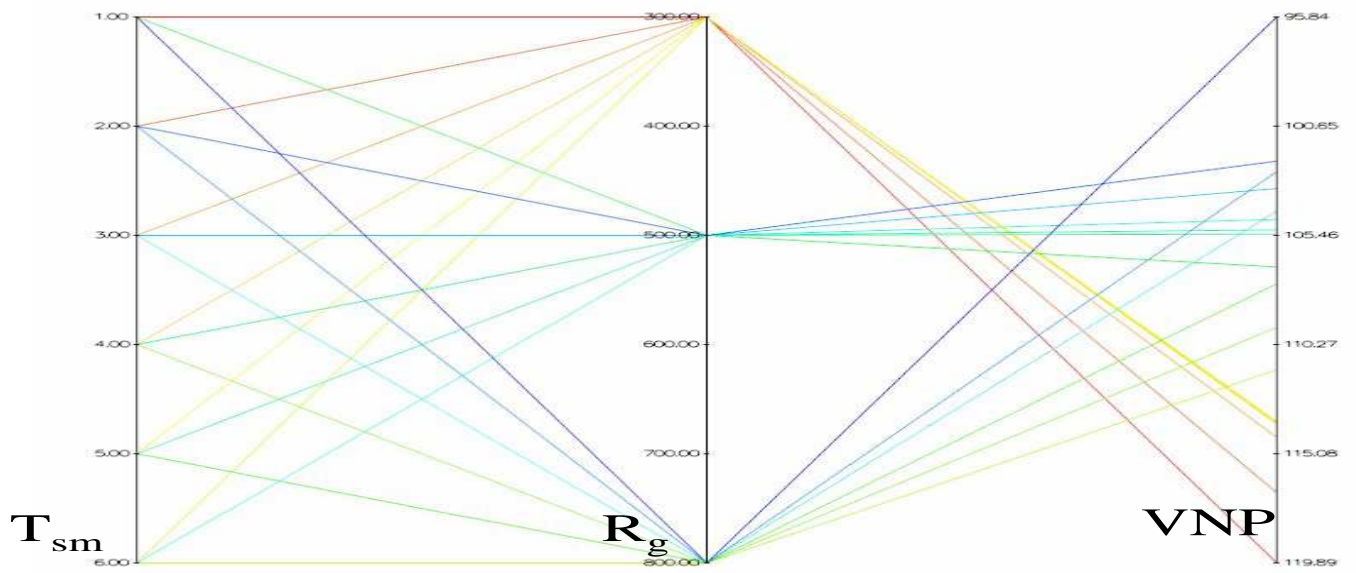
438

(c) EEMMASMP



(d) EEMMASMH

Figure J.9: Influence of $R_g$ and $T_{sm}$ on the VNP objective for $N_G = 300$ (cont.)
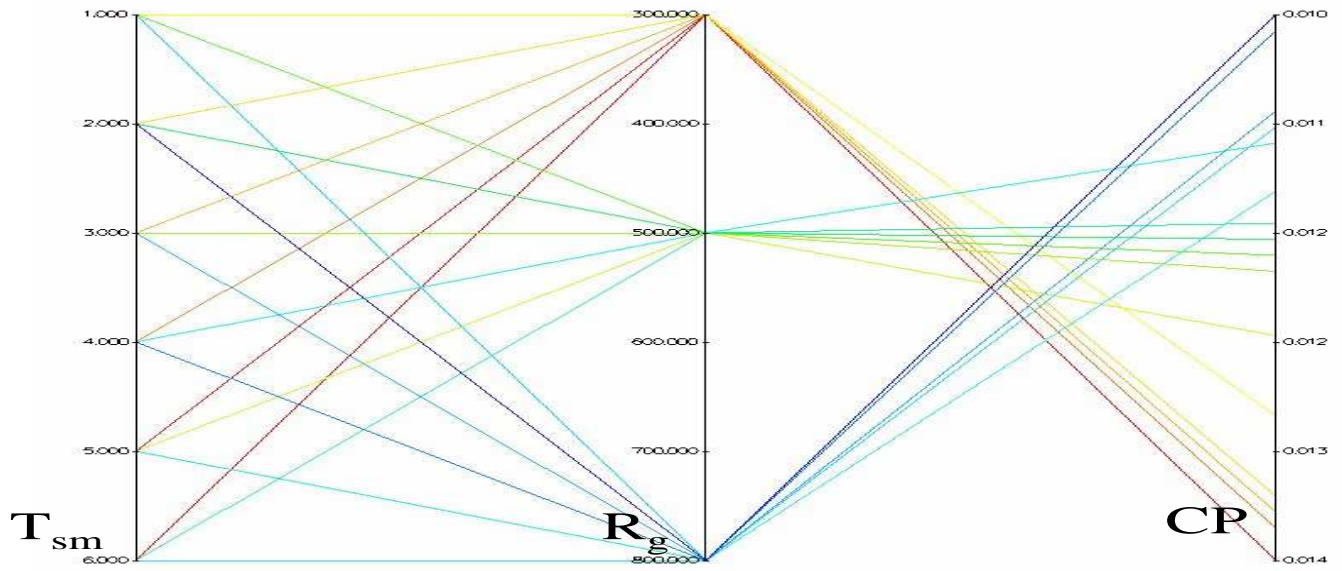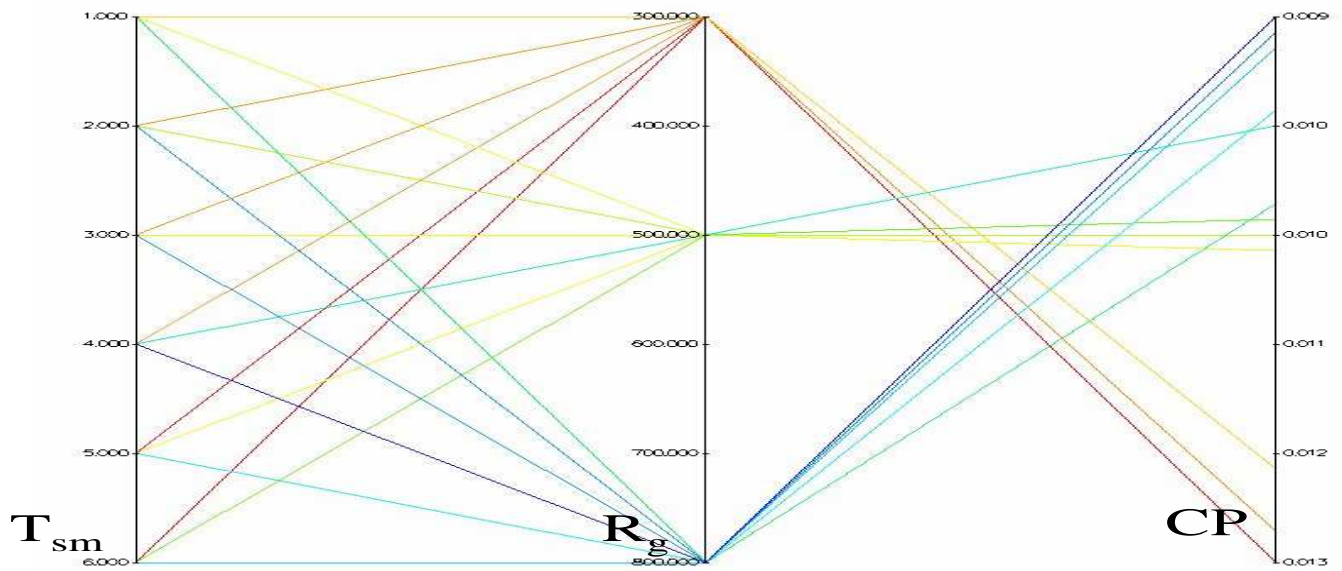
(e) EEMACOMC



(f) NSGA-II-MPA

Figure J.9: Influence of $R_g$ and $T_{sm}$ on the VNP objective for $N_G = 300$ (cont.)
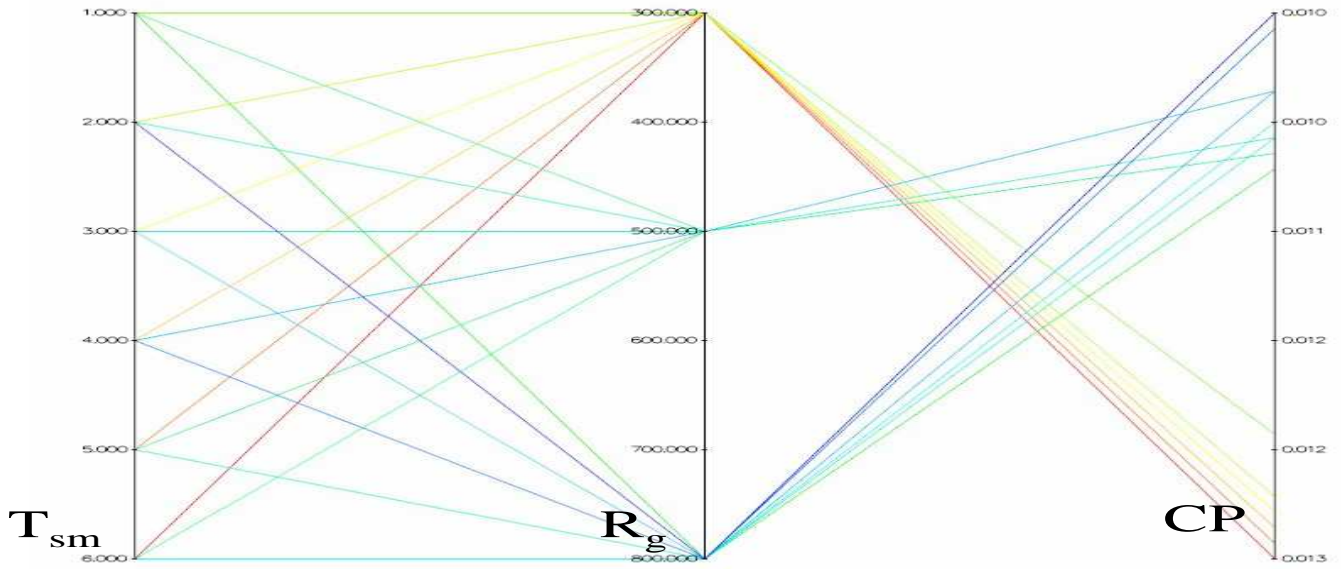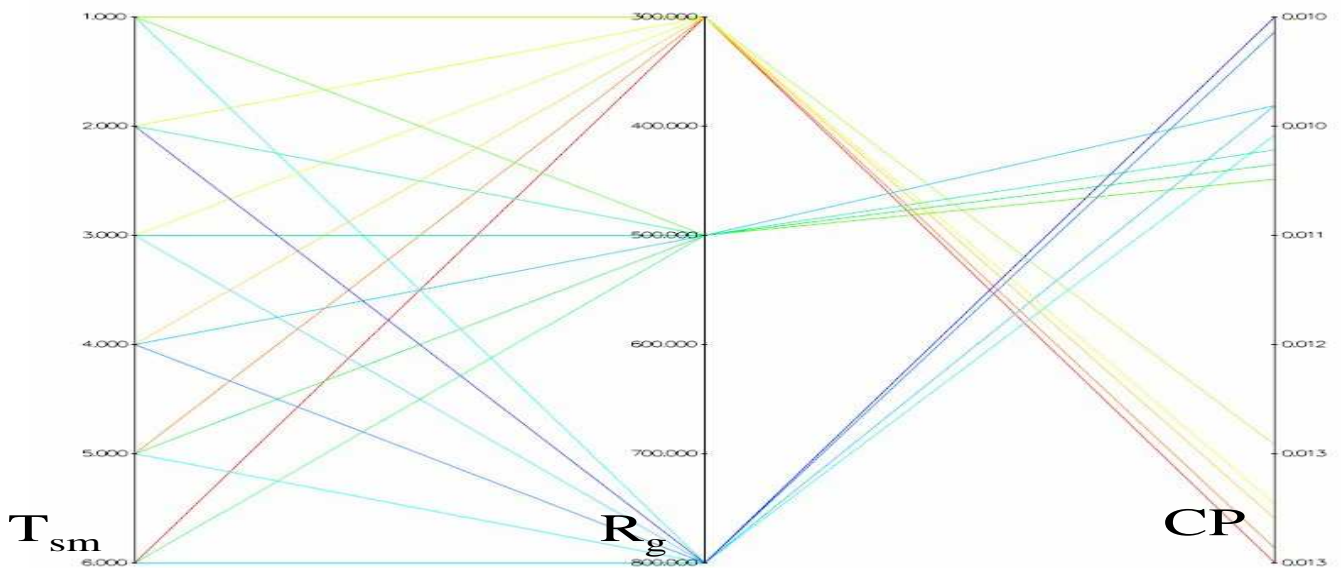
(a) EEMACOMP



(b) EEMACOMH

Figure J.10: Influence of $R_g$ and $T_{sm}$ on the CP objective for $N_G = 30$
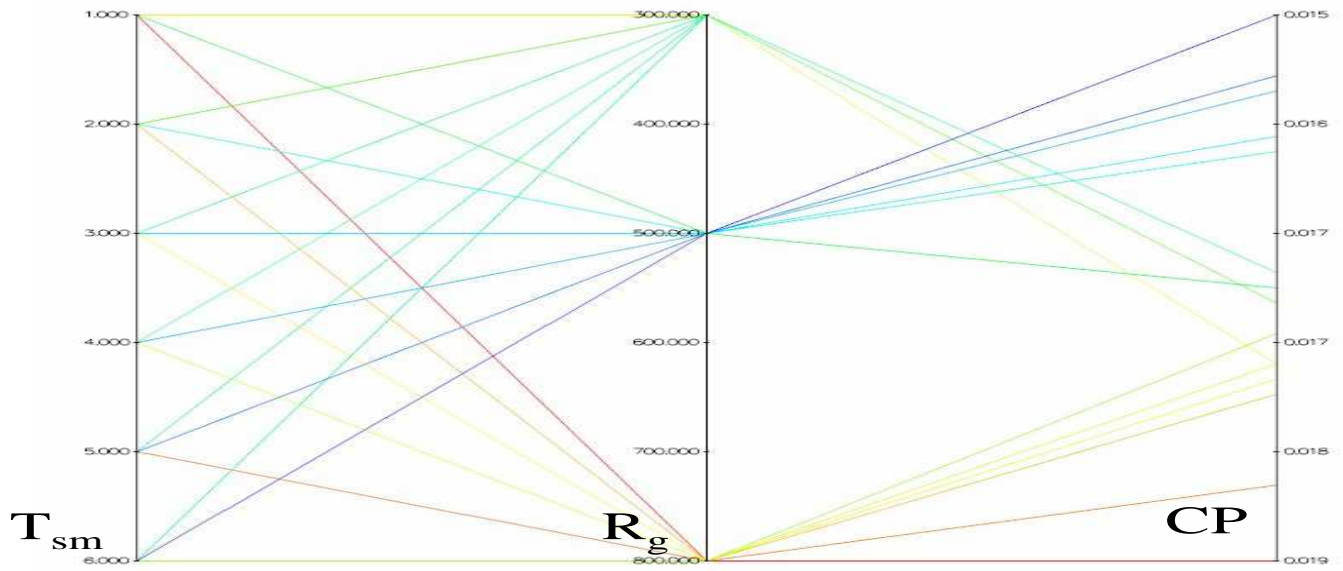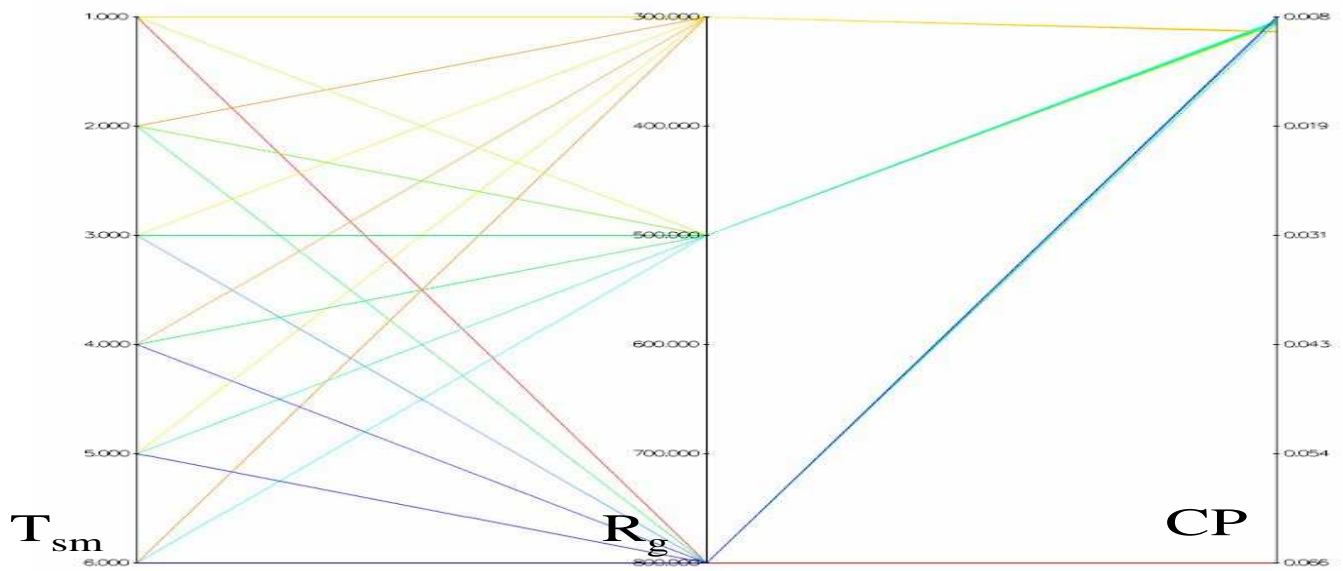
(c) EEMMASMP



(d) EEMMASMH

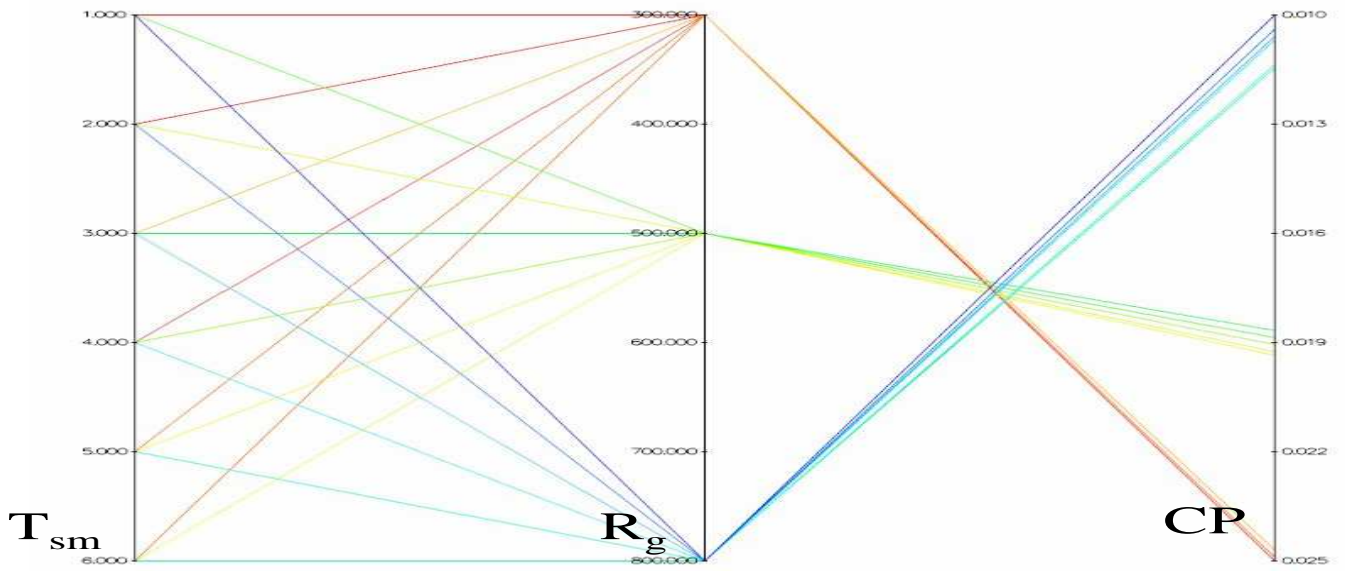Figure J.10: Influence of $R_g$ and $T_{sm}$ on the CP objective for $N_G = 30$ (cont.)
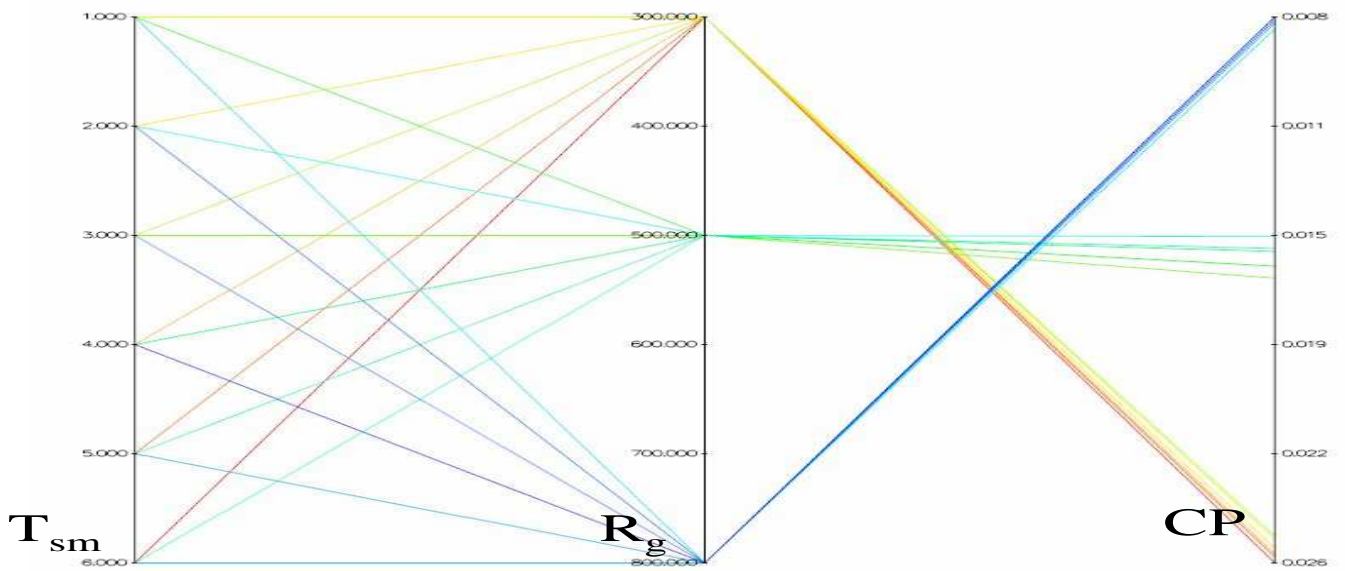
(e) EEMACOMC



(f) NSGA-II-MPA

Figure J.10: Influence of $R_g$ and $T_{sm}$ on the CP objective for $N_G = 30$ (cont.)
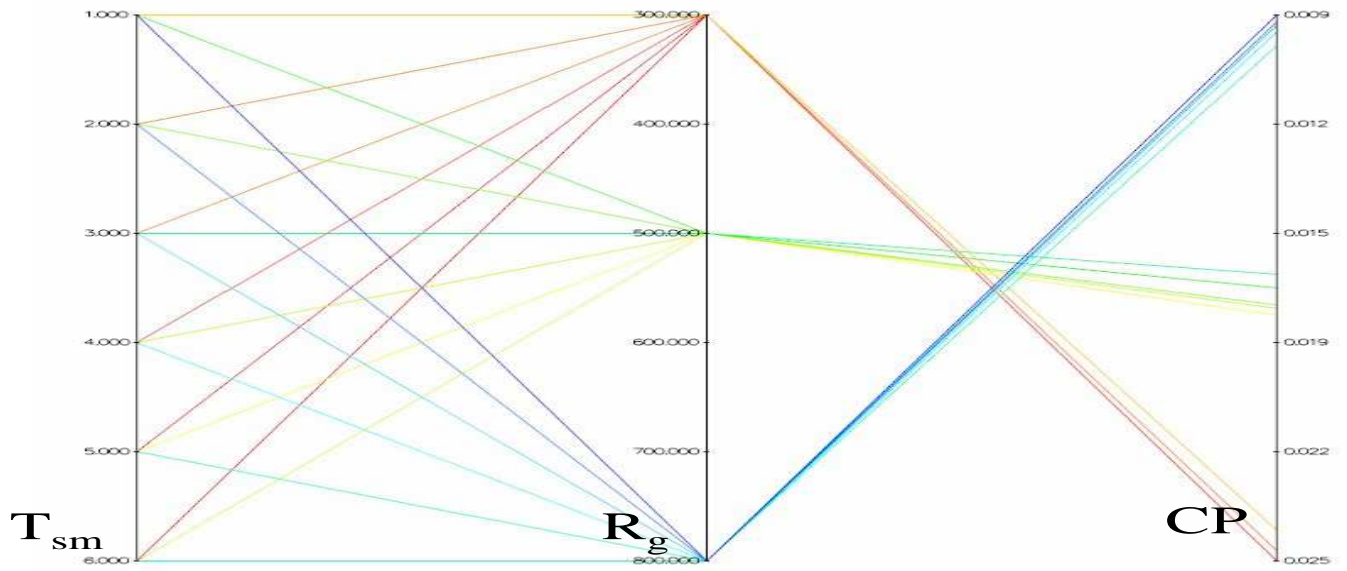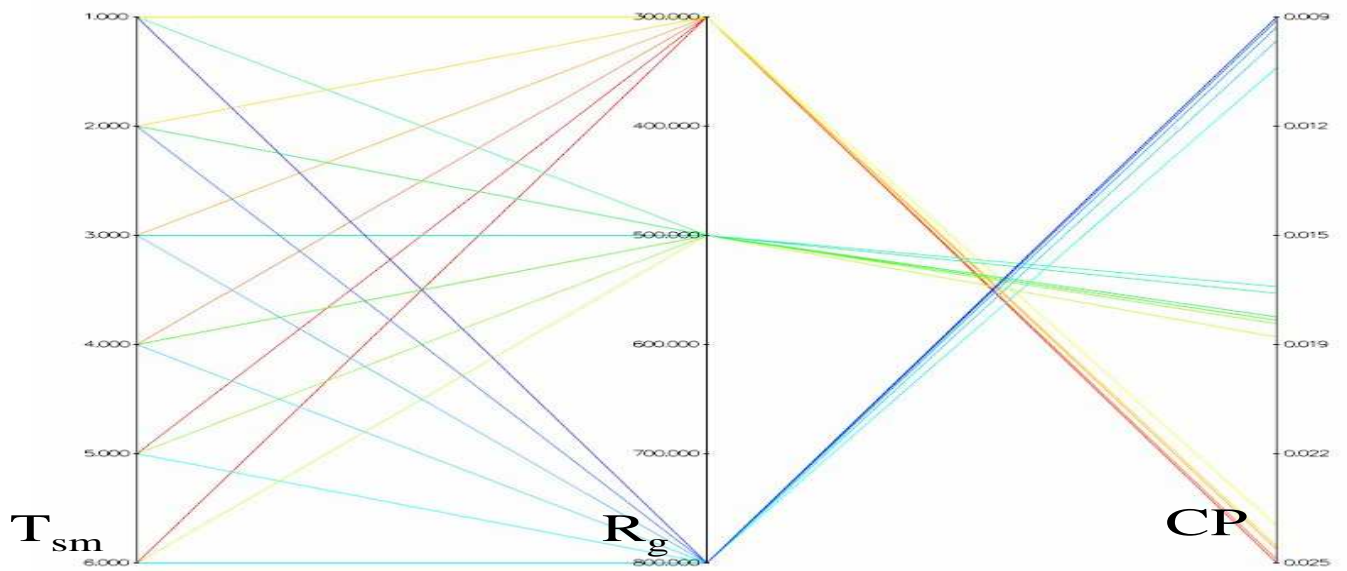
(a) EEMACOMP



(b) EEMACOMH

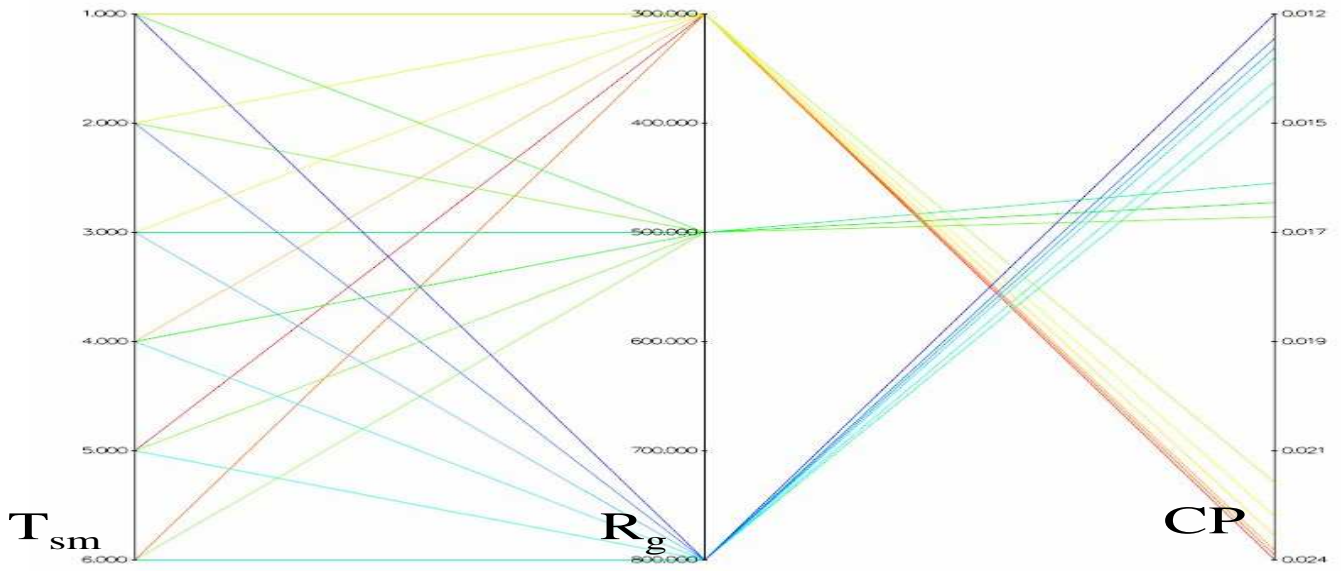Figure J.11: Influence of $R_g$ and $T_{sm}$ on the CP objective for $N_G = 100$
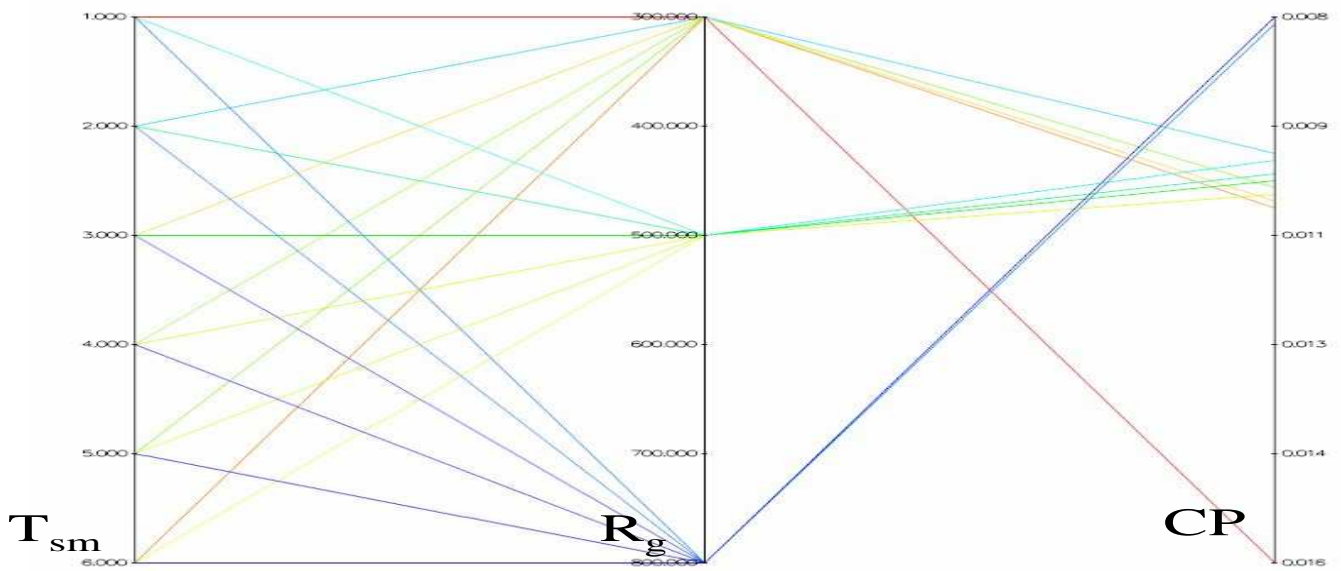
(c) EEMMASMP



(d) EEMMASMH

Figure J.11: Influence of $R_g$ and $T_{sm}$ on the CP objective for $N_G = 100$ (cont.)
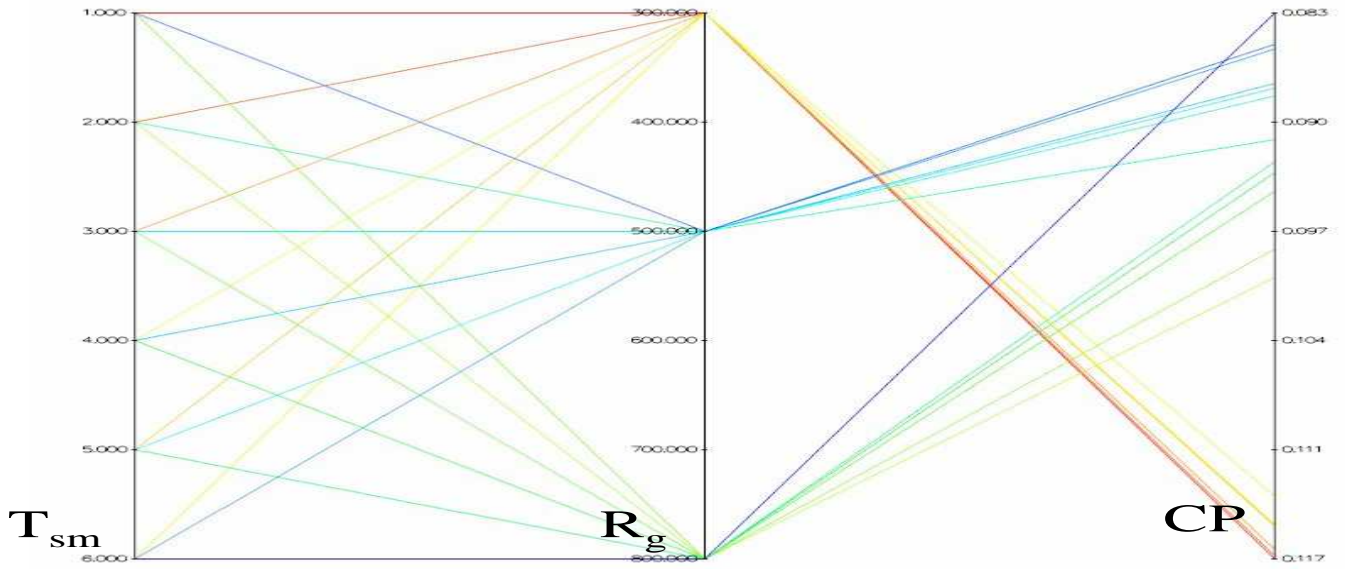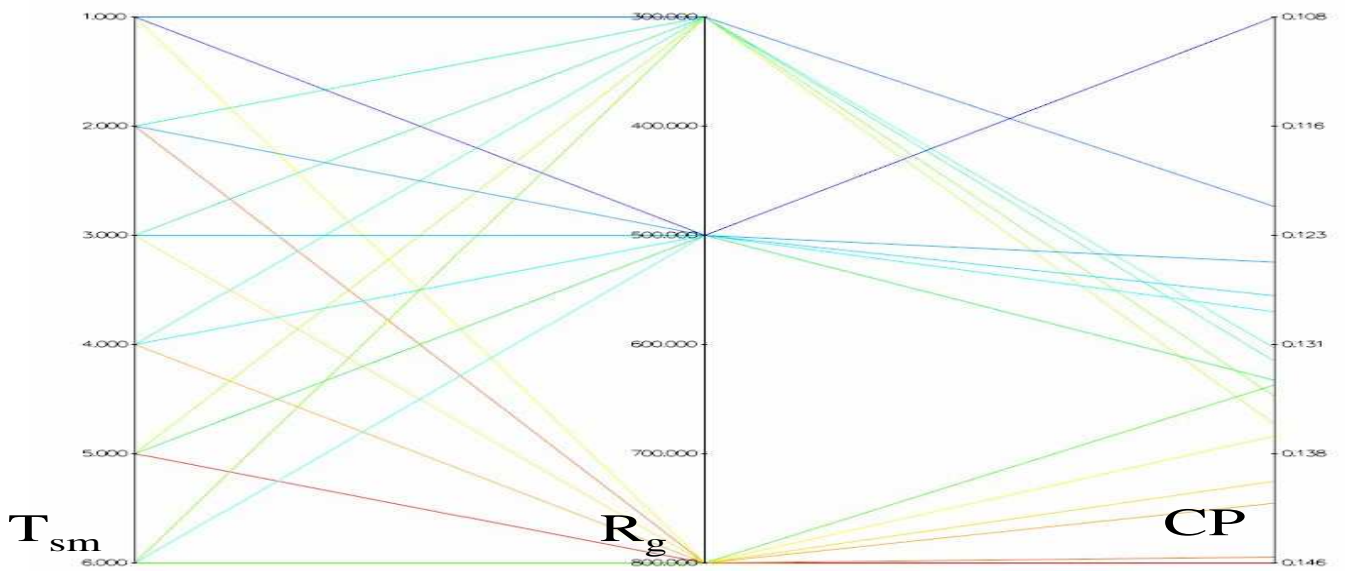
(e) EEMACOMC



(f) NSGA-II-MPA

Figure J.11: Influence of $R_g$ and $T_{sm}$ on the CP objective for $N_G = 100$ (cont.)
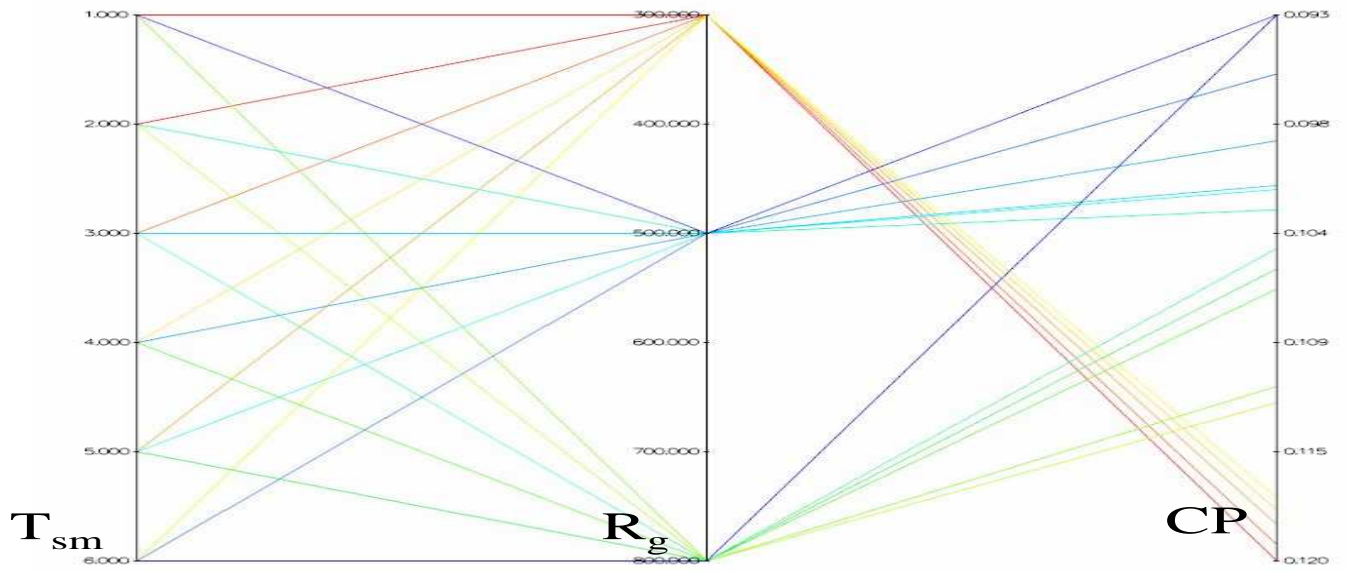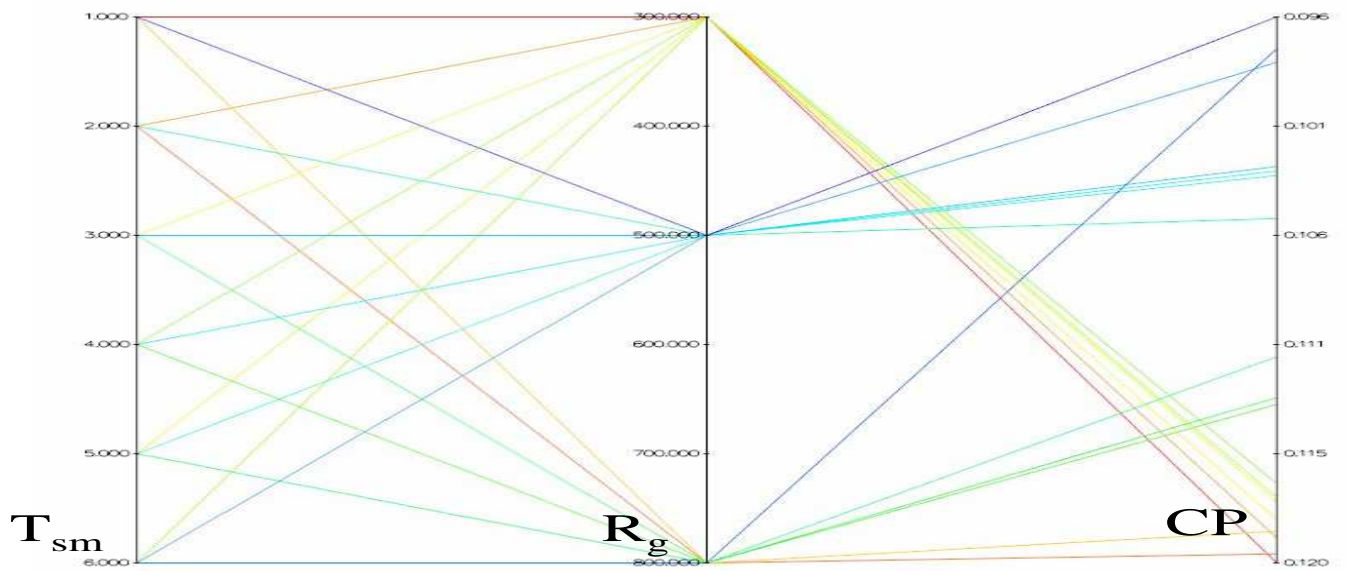
(a) EEMACOMP



(b) EEMACOMH

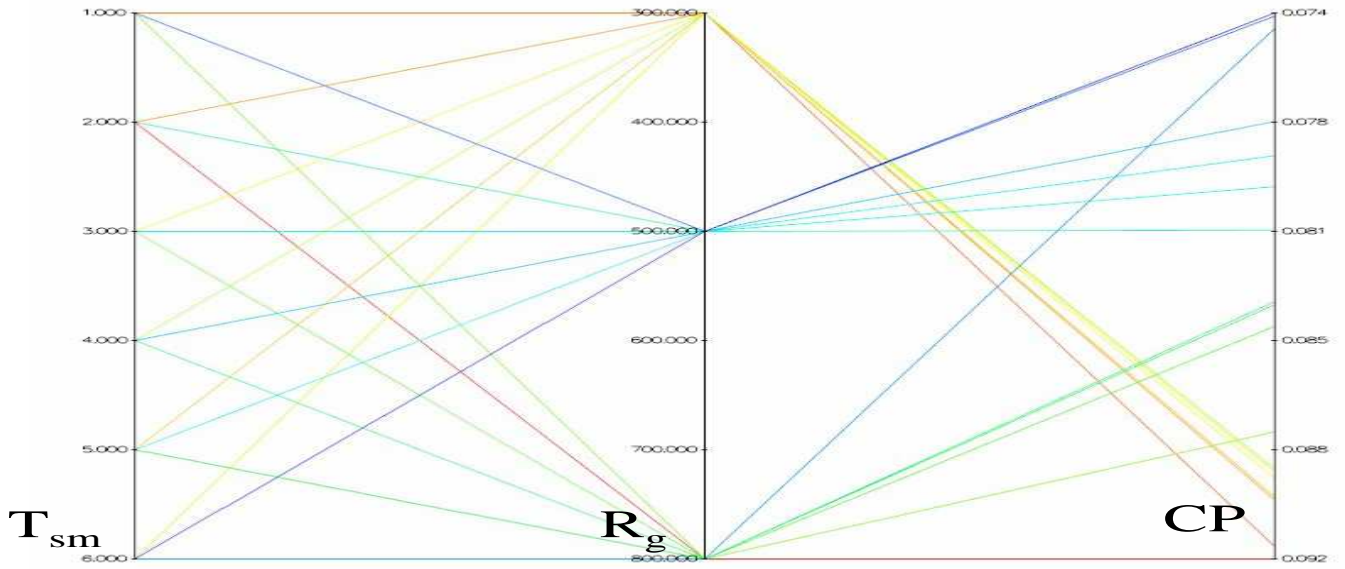Figure J.12: Influence of $R_g$ and $T_{sm}$ on the CP objective for $N_G = 300$
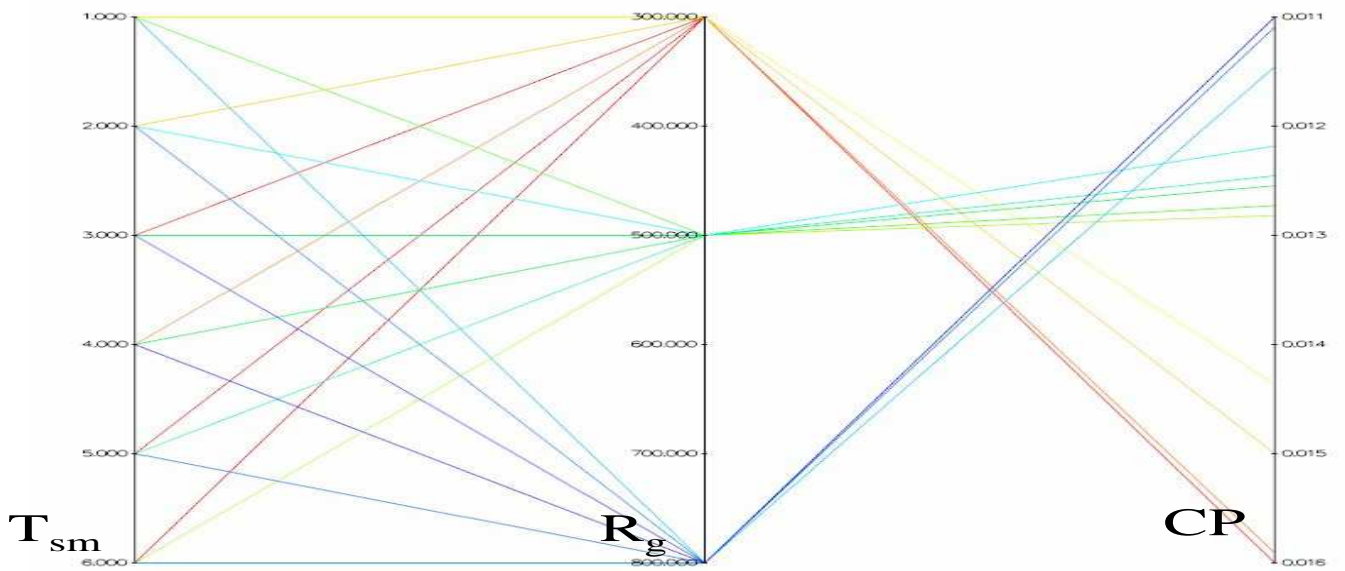
447

(c) EEMMASMP



(d) EEMMASMH

Figure J.12: Influence of $R_g$ and $T_{sm}$ on the CP objective for $N_G = 300$ (cont.)
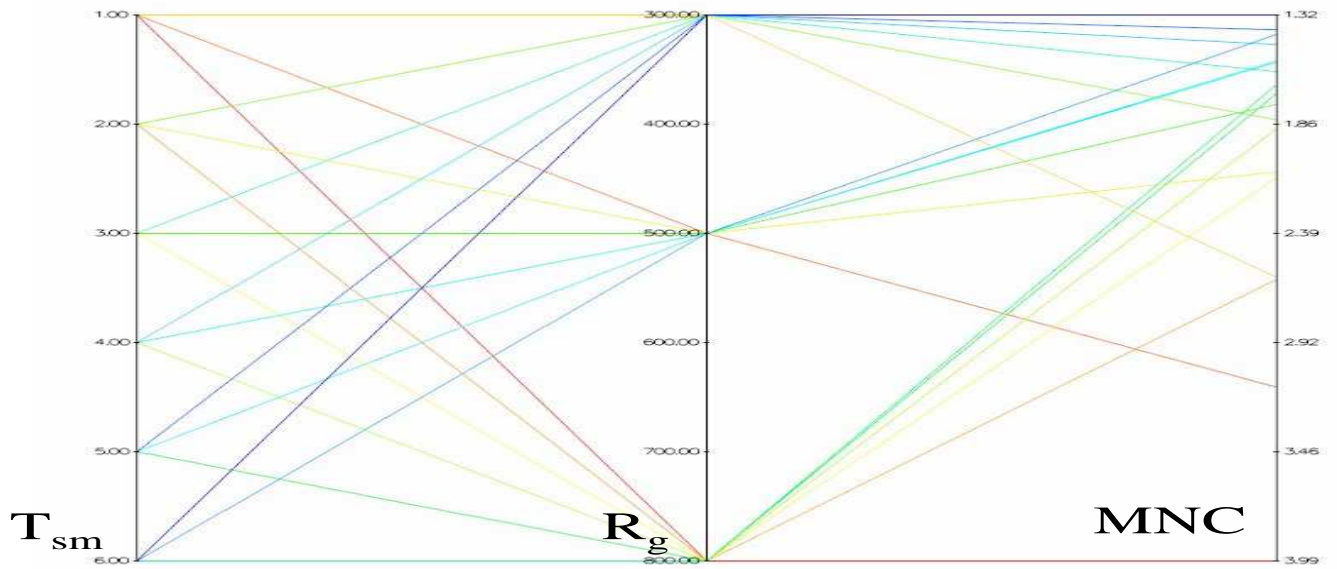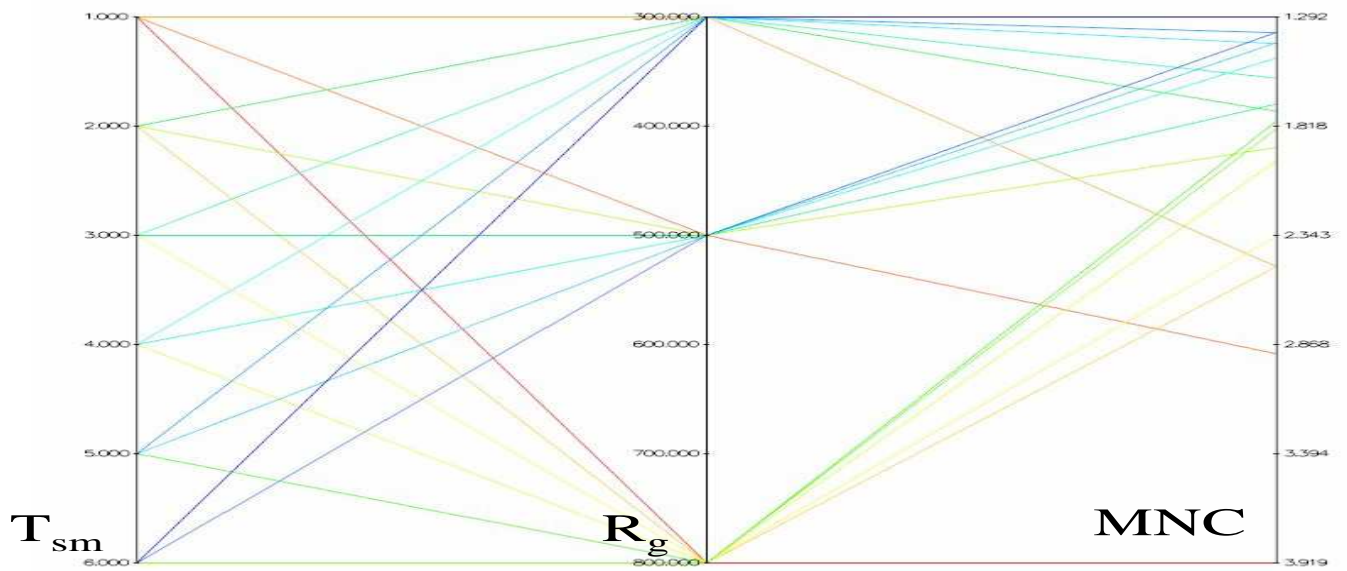
(e) EEMACOMC



(f) NSGA-II-MPA

Figure J.12: Influence of $R_g$ and $T_{sm}$ on the CP objective for $N_G = 300$ (cont.)
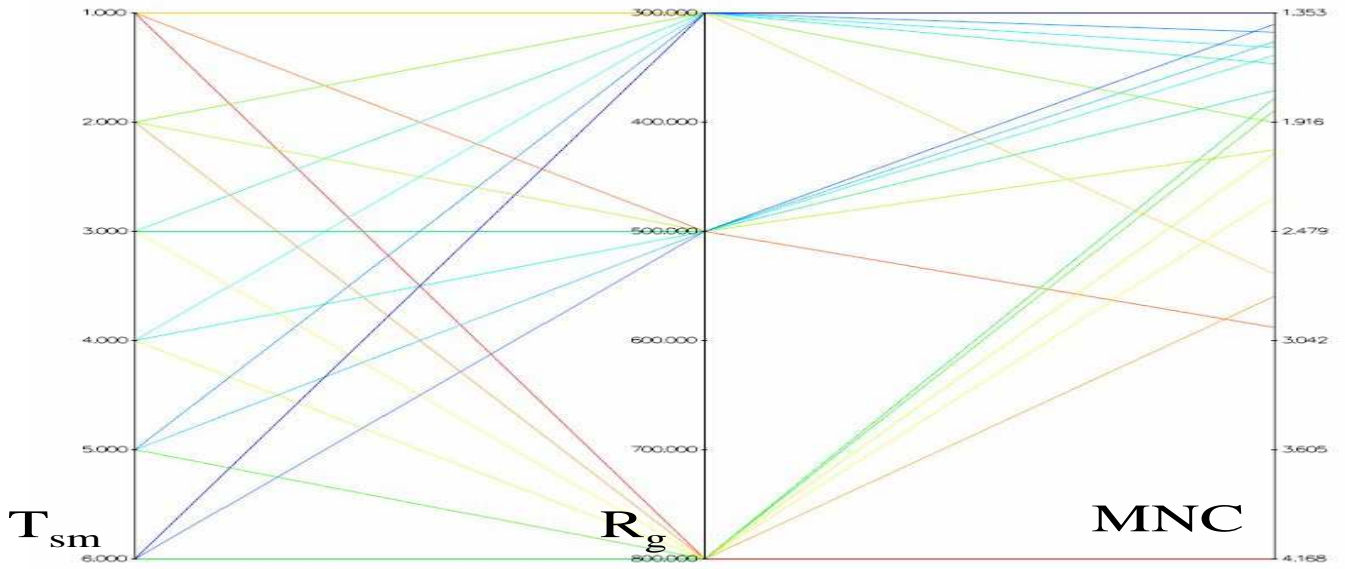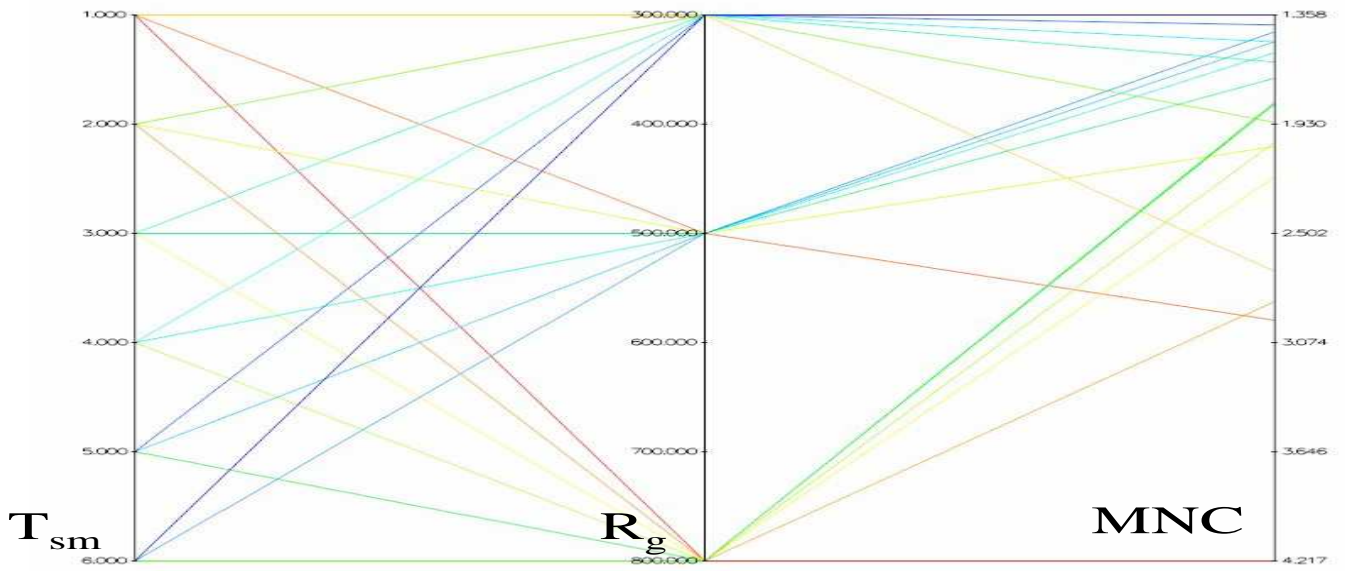
(a) EEMACOMP



(b) EEMACOMH

Figure J.13: Influence of $R_g$ and $T_{sm}$ on the MNC objective for $N_G = 30$
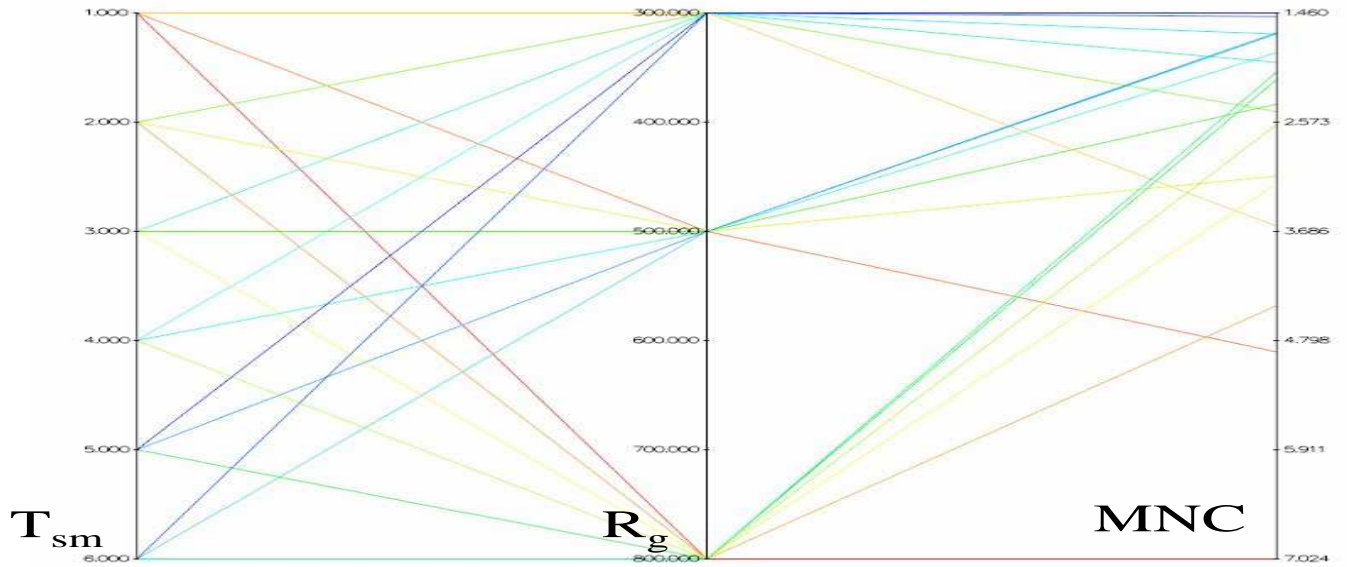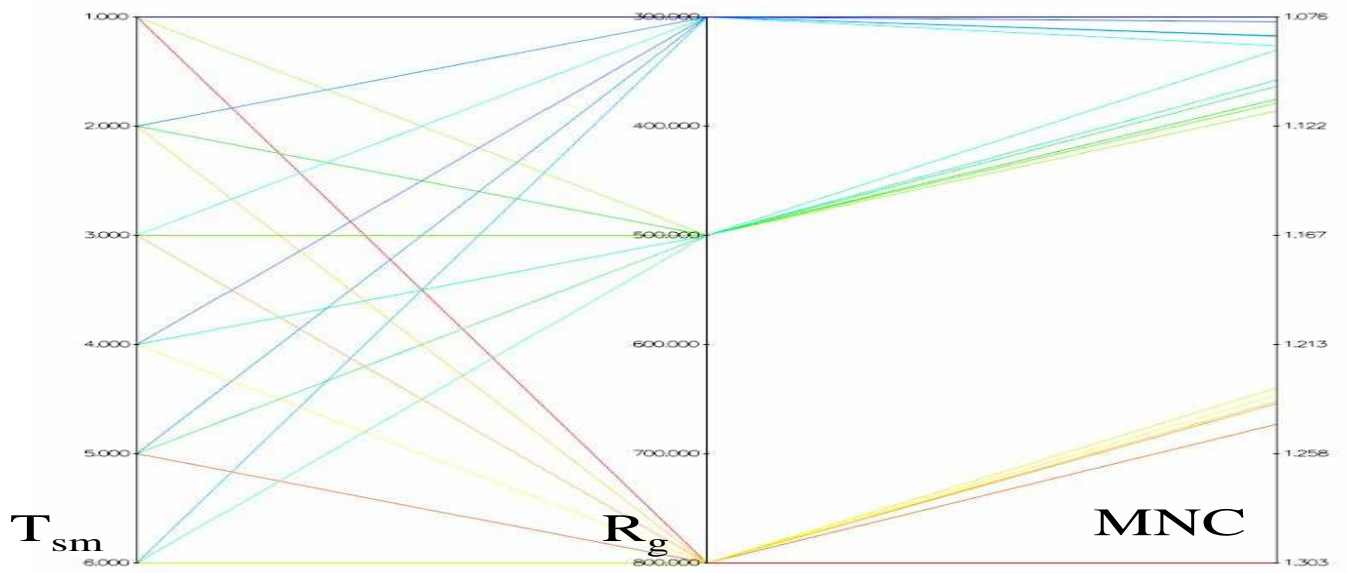
(c) EEMMASMP



(d) EEMMASMH

Figure J.13: Influence of $R_g$ and $T_{sm}$ on the MNC objective for $N_G = 30$ (cont.)
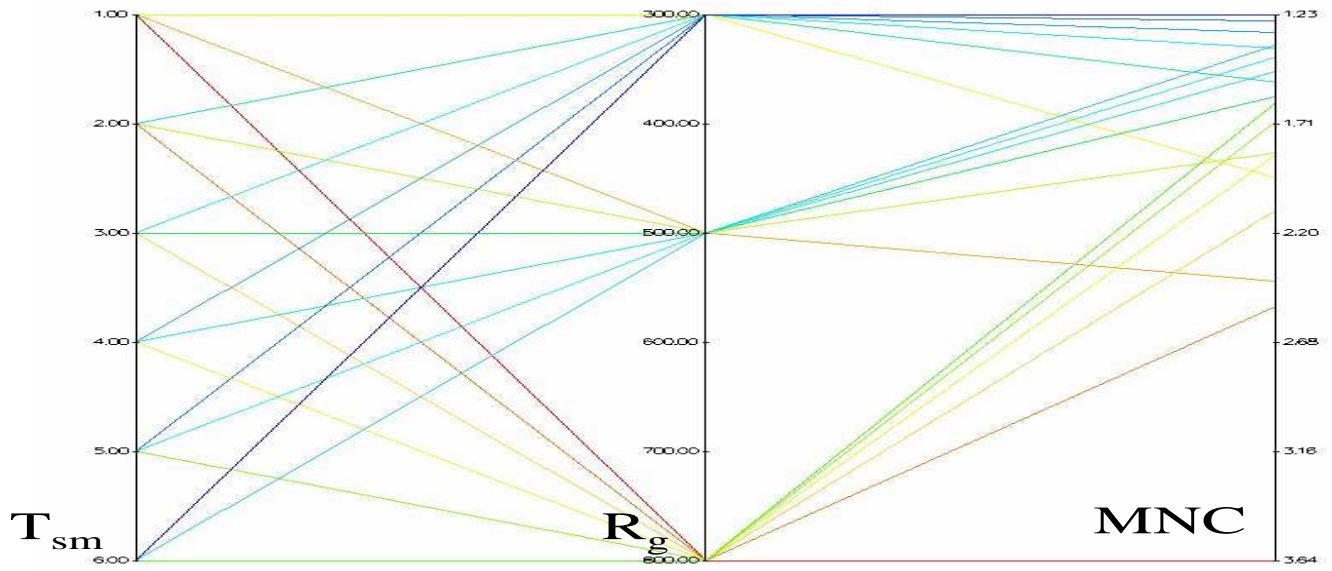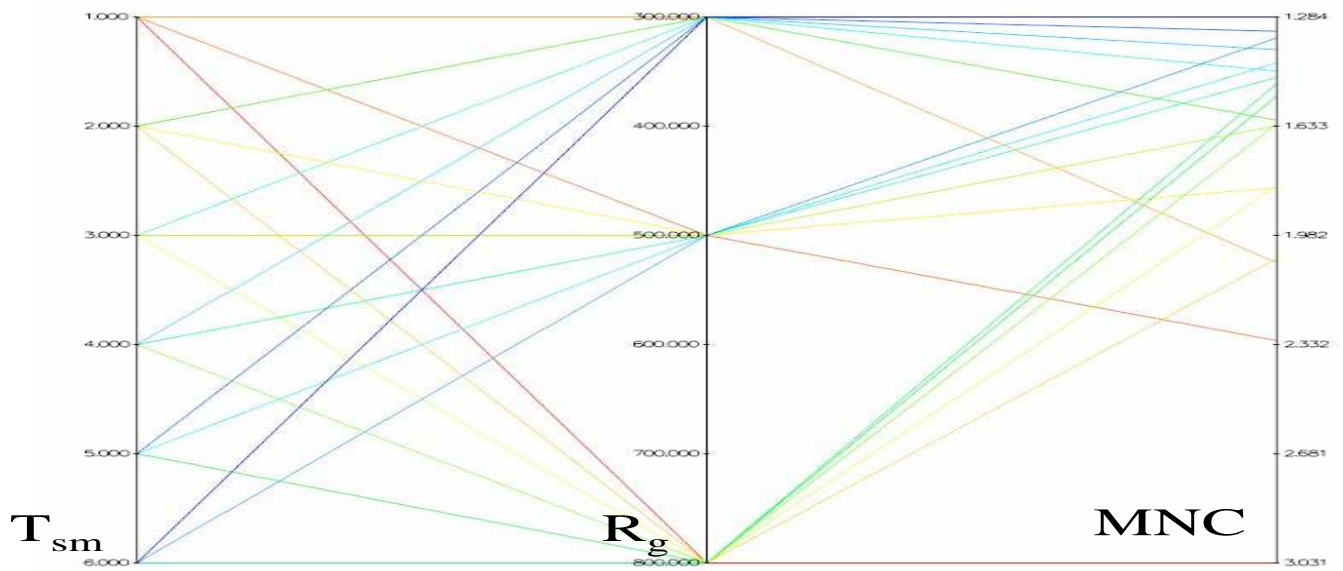
(e) EEMACOMC



(f) NSGA-II-MPA

Figure J.13: Influence of $R_g$ and $T_{sm}$ on the MNC objective for $N_G = 30$ (cont.)

(a) EEMACOMP



(b) EEMACOMH

Figure J.14: Influence of $R_g$ and $T_{sm}$ on the MNC objective for $N_G = 100$

453

(c) EEMMASMP



(d) EEMMASMH

Figure J.14: Influence of $R_g$ and $T_{sm}$ on the MNC objective for $N_G = 100$ (cont.)

(e) EEMACOMC



(f) NSGA-II-MPA

Figure J.14: Influence of $R_g$ and $T_{sm}$ on the MNC objective for $N_G = 100$ (cont.)
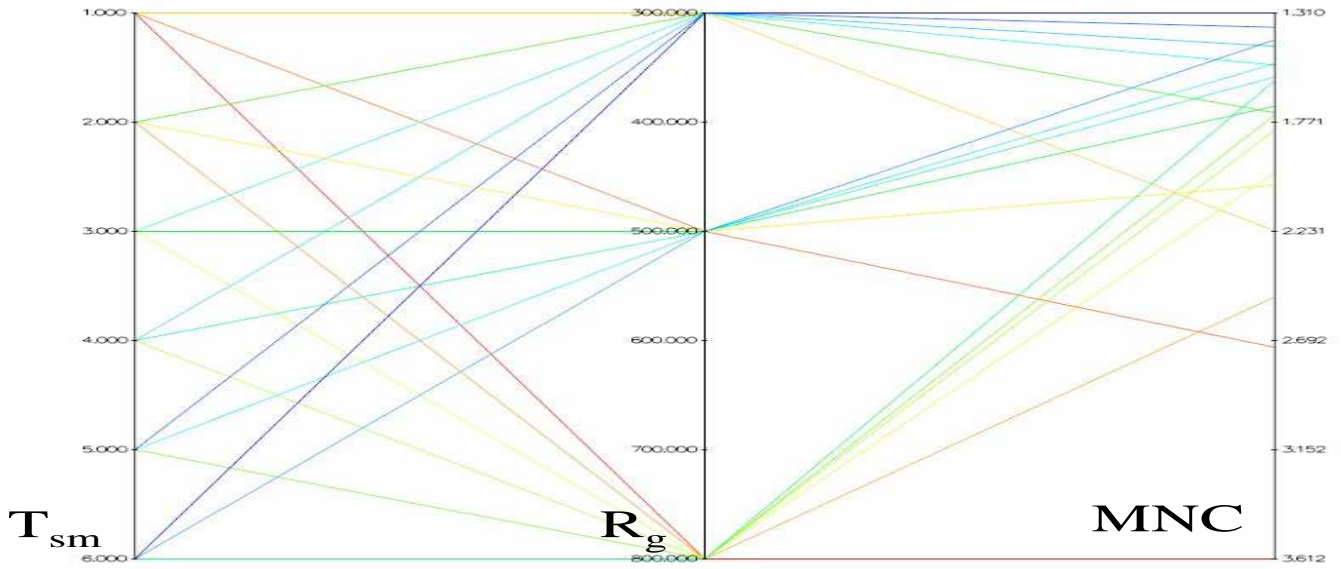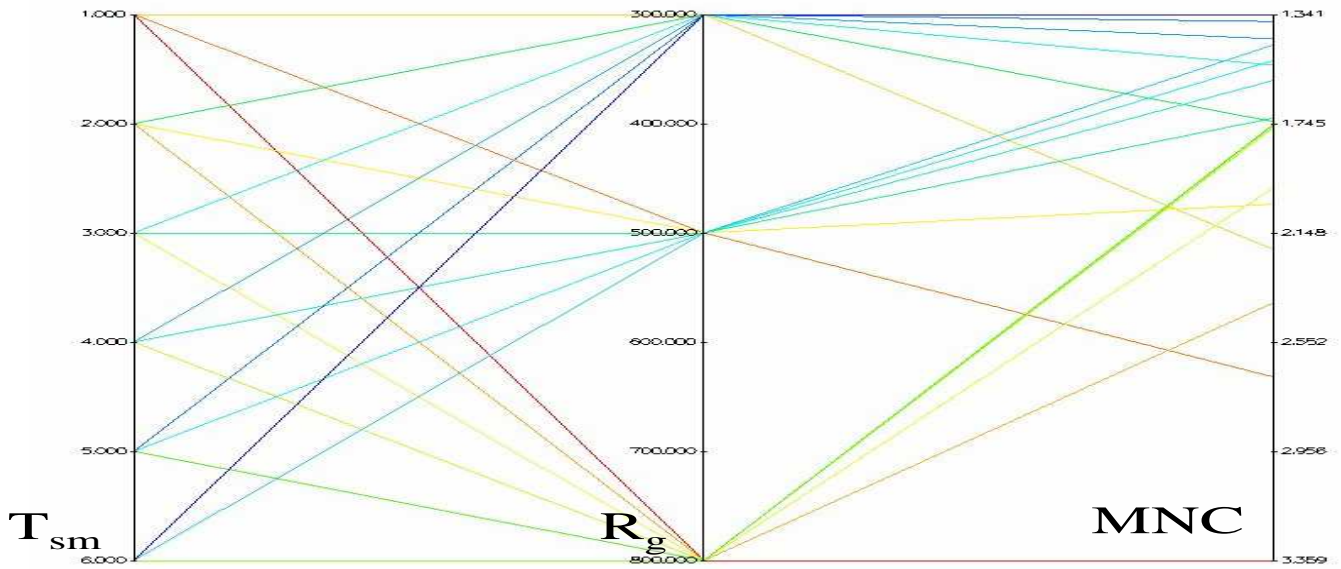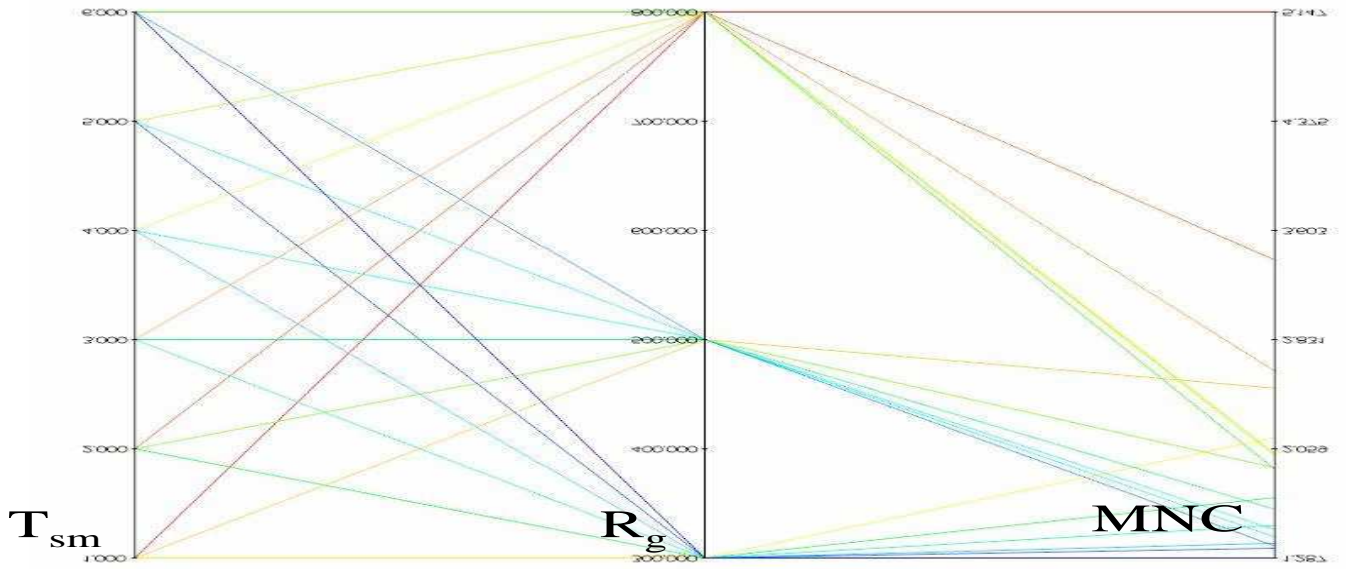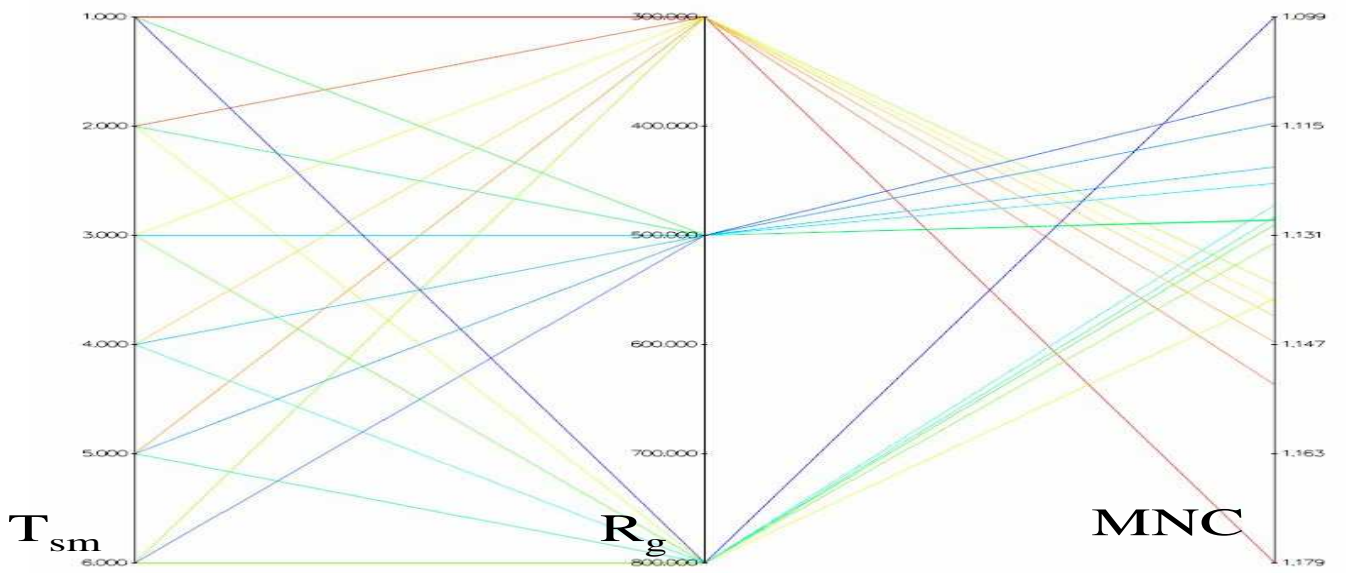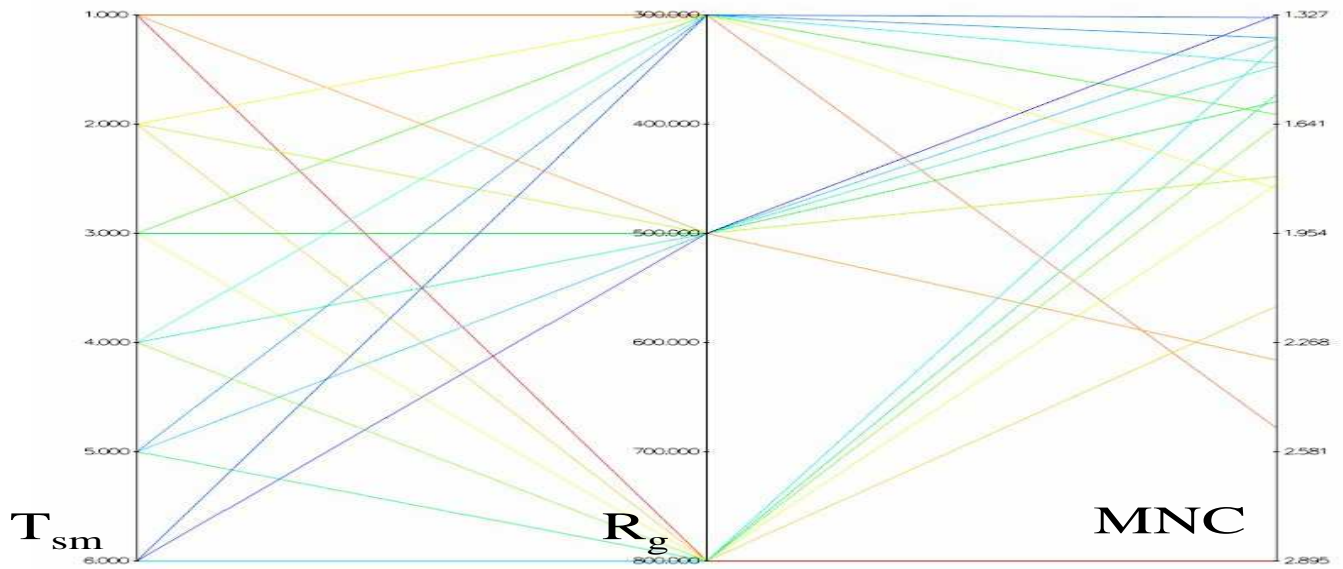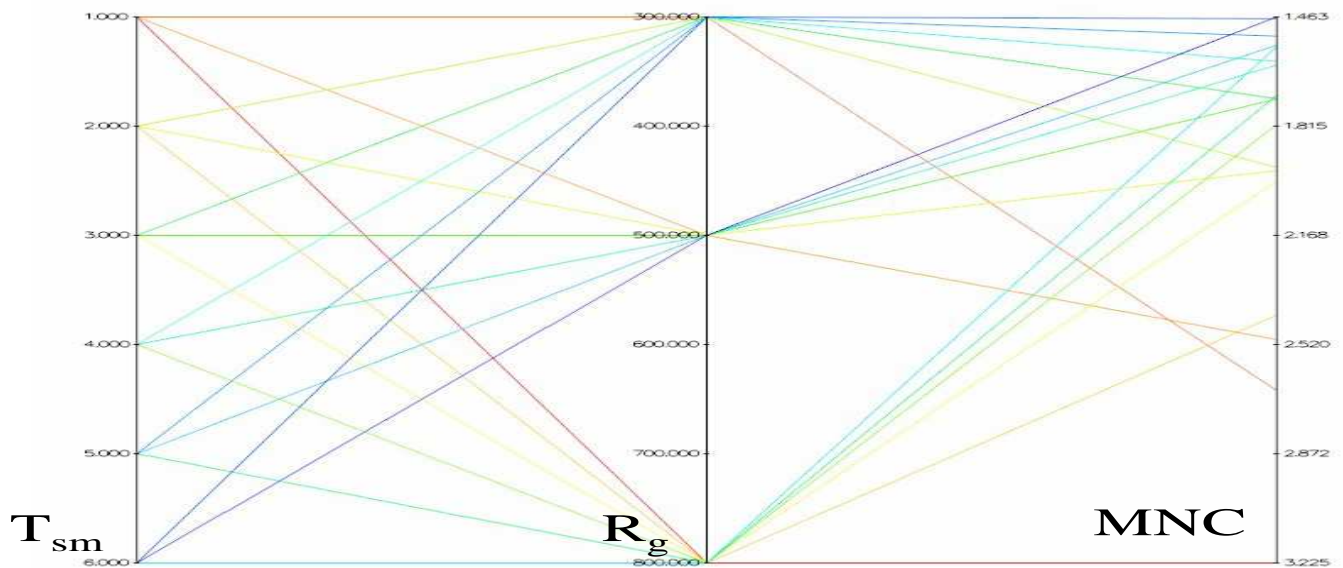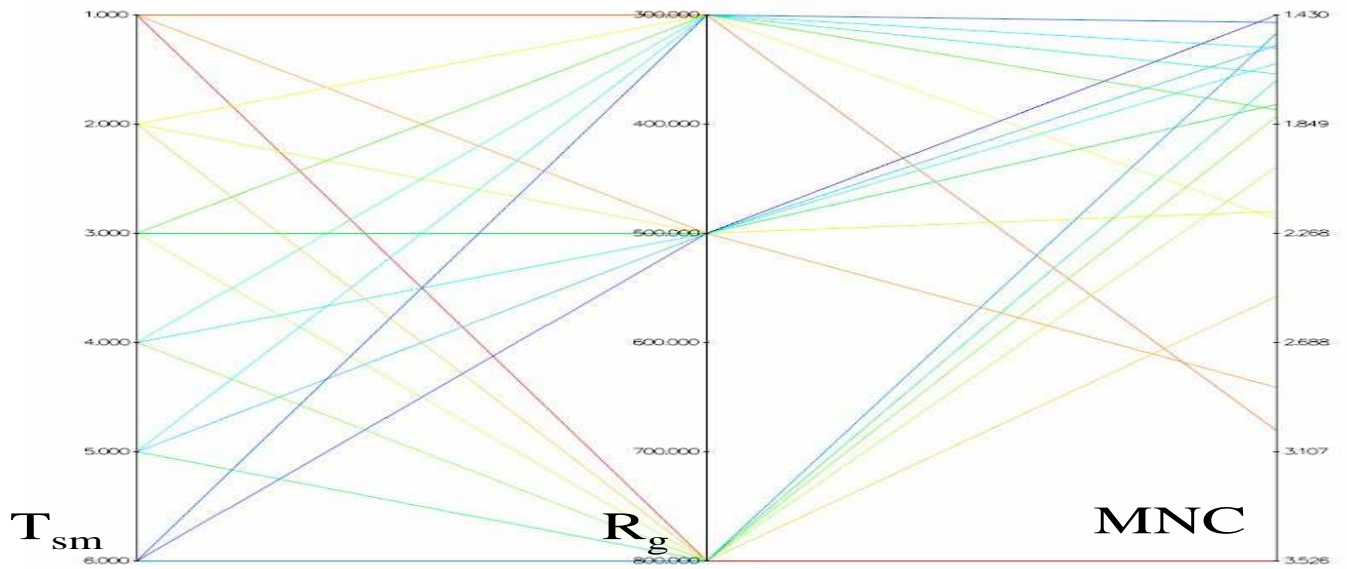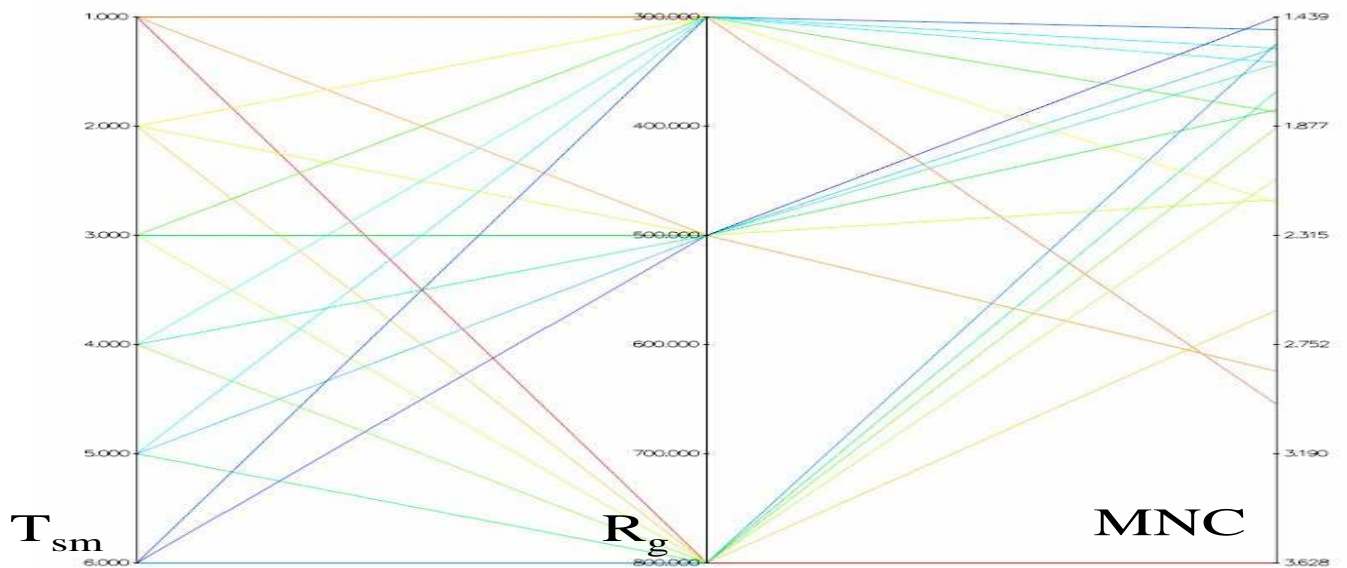
(a) EEMACOMP



(b) EEMACOMH

Figure J.15: Influence of $R_g$ and $T_{sm}$ on the MNC objective for $N_G = 300$
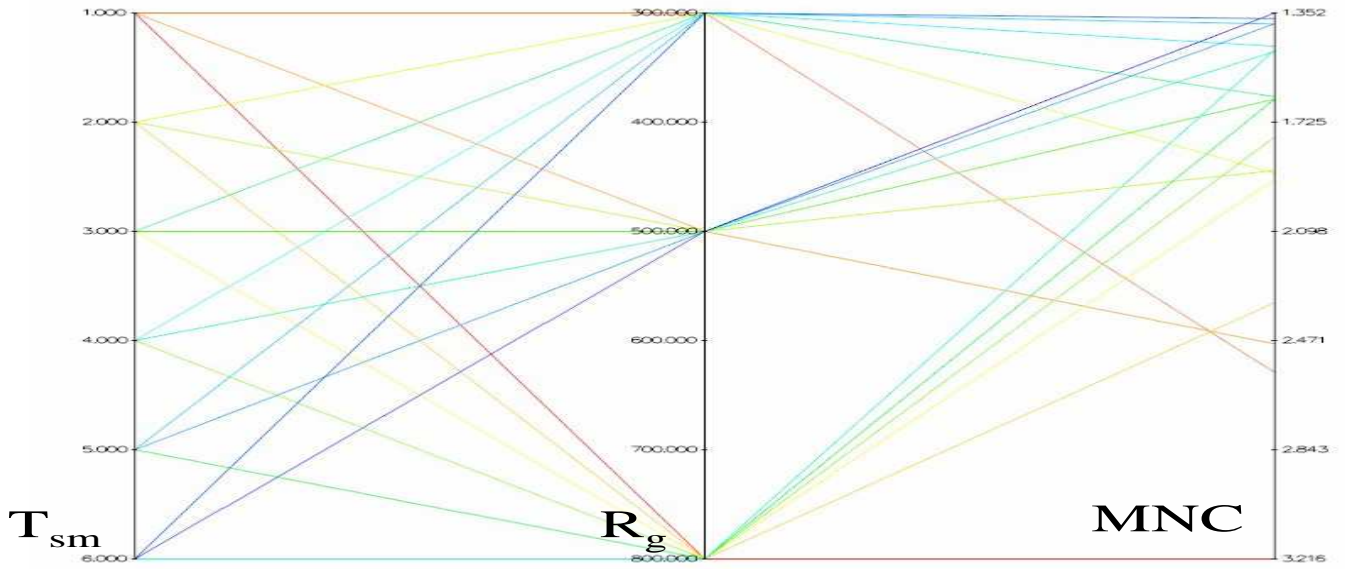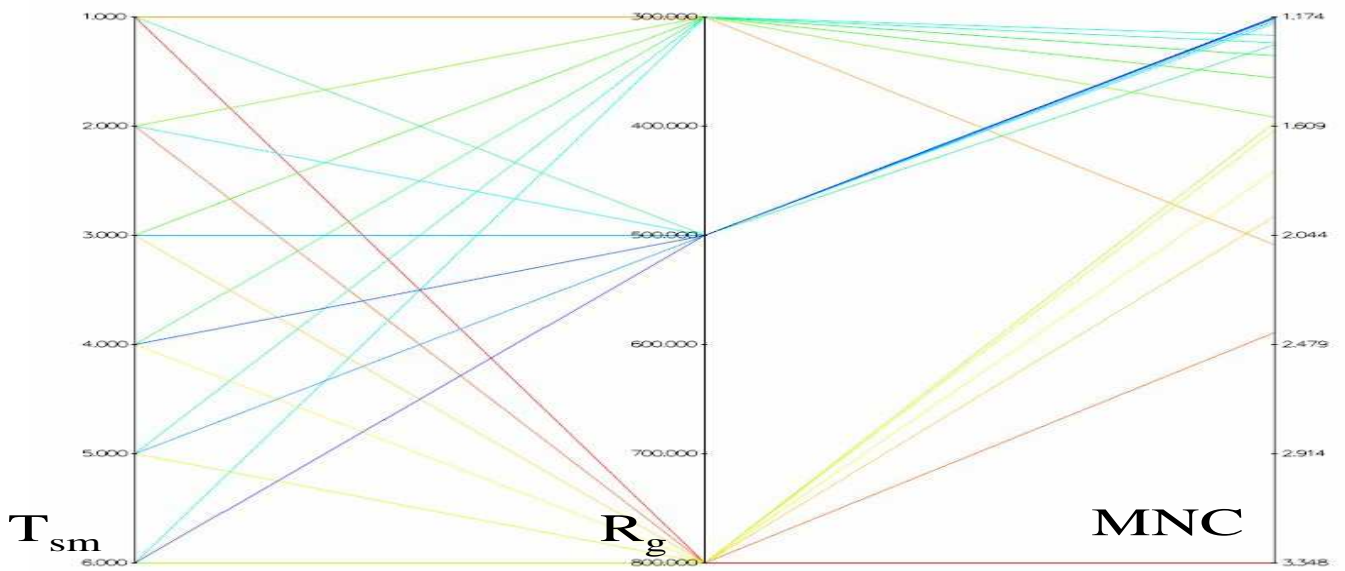
(c) EEMMASMP



(d) EEMMASMH

Figure J.15: Influence of $R_g$ and $T_{sm}$ on the MNC objective for $N_G = 300$ (cont.)

(e) EEMACOMC



(f) NSGA-II-MPA

Figure J.15: Influence of $R_g$ and $T_{sm}$ on the MNC objective for $N_G = 300$ (cont.)