



**Supplemental Fig. 1** First three leading EOF patterns, as in Fig. 10, but of high-pass SSTA in the Tropical Indian Ocean and Pacific for a selection of model simulations and observations. In addition to the observations, the CMIP3 and CMIP5 super models, the models with the largest (GISS-AOM) and smallest (ECHAM5/MPI-OM)  $RMSE_{EOF}$  value are shown.