Geophysical Research Abstracts
Vol. 16, EGU2014-16640-1, 2014
EGU General Assembly 2014


# Evaluation of ACCMIP simulated fine-mode AOD and its implication for aerosol direct forcing

Hyein Park (1), Chul Eddy Chung (1), Annica Ekman (2), and Jung-Ok Choi (1)

(1) School of Environmental Science and Engineering, GIST (Gwangju Institute of Science and Technology), (2) Department of Meteorology and Bolin Centre for Climate Research, Stockholm University

This study examines and evaluates simulated aerosol optical depth (AOD) and fine-mode AOD (fAOD) from the ACCMIP and CMIP5 global model archives. Satellite data nudged to AERONET data are used to construct reliable global observations of AOD and fAOD for validating the simulations. The difference in simulated global average AOD among models is of the order of a factor of 2, and the difference is even larger ($\sim$ factor of 3) for fAOD. Compared to the observations, the models tend to underestimate AOD and fAOD significantly over eastern China. Another important discrepancy is that the models show larger fAOD over the Indus-Ganga Plain in summer than in winter, whereas the observations display an opposite feature. The models also overestimate the fAOD over the biomass burning regions of central Africa in DJF and underestimate the fAOD over the biomass burning regions of southern Africa in JJA. To evaluate the effect of the discrepancy between modeled and observed fAOD on aerosol direct radiative forcing, an offline radiation model is utilized. Comparing the model-fAOD-derived fine-mode forcing with the fine-mode forcing derived from the fAOD observation, the models tend to give too large (negative) value. This result implies that the calculated anthropogenic aerosol forcing in ACCMIP and CMIP5 models has a negative bias.