



## **Aerosol Optical Depth over Arabian Peninsula: a Validation of ECHAM5-HAM against Ground-Based and Satellite Data**

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This research validates aerosol optical depth (AOD) of the global climate – aerosol model (ECHAM5-HAM) for the period 2005 – 2011 over Arabian Peninsula. The ECHAM5-HAM AOD is evaluated at mid visible wavelength (550 nm) against AOD observation at three AERONET ground-base stations, and against satellite AOD measurements carried out by MODIS (Moderate Resolution Imaging Spectroradiometer). Average AOD monthly data for the period 2005 – 2011 is extracted from the model ECHAM5-HAM and compared to three AERONET stations located over Arabian Peninsula representing western (Hada Al-Sham), central (Solar Village) and eastern (Kuwait) regions. In addition, semillar comparison to MODIS AOD were carried out over all and over six sub-regions of Arabian Peninsula. The model overestimates the Angstrom Exponent by 0.69 and underestimate AOD by -0.15, but the model AOD is in a good correlation with observation (0.66) over Arabian Peninsula. This makes the model capable of predicting successfully the aerosol annual cycle over Arabian Peninsula. The ECHAM5-HAM model overestimates the Angstrom Exponent and underestimates AOD over Arabian Peninsula, but it correlates well with observation. This implys that the model can be improved for regions dominated by dust, and can be effective in studying the various aspects of aerosol interactions in the atmosphere including investigating the direct and indirect influence of aerosols on the climate of Arabian Peninsula.