Impact of Aerosols on Indian Summer Monsoon: A Regional Climate Modeling Study

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During summer months, Indian subcontinent influenced by significant dust transport which leads to high aerosol loading over the region. Studies show that aerosol forcing influences the characteristics of Indian Summer Monsoon by modifying both the circulation and precipitation. The objective of the present study is to examine the regional aerosol forcing and its influence on seasonal and interannual variabilities of Indian Summer Monsoon using a regional scale model. The Regional Climate Model Version 3 (RegCM3) coupled with aerosol model is used for the study. Model domain roughly covers Indian and Arabian Subcontinents with a horizontal resolution of 60km. Initial and lateral boundary conditions are taken from NCEP/NCAR reanalysis data. Model simulations are carried with and without the aerosol feedback. Simulations are compared with NCEP/NCAR reanalysis and with precipitation analysis. Results showed that the ability of the model to reproduce precipitation and circulation during summer monsoon over Indian summer monsoon is significantly affected by aerosols.