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Meteorological parameter estimation using field monitored data and its comparison with prognostic model generated parameters for source dispersion modelling

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The topic of meteorological model evaluation has been the focus of many air quality-related studies. A large majority of meteorological model evaluations center on how the model performs with regard to predicting surface-based measurements of temperature, wind speed, moisture, and precipitation. Results from air quality simulations, which can have extensive ramifications, are closely linked to the meteorological models that drive the chemical transport, diffusion, and chemical reactions in the air quality. Thus, meteorological models need to be evaluated thoroughly along with the air quality models A prognostic meteorological model MM5 was used to generate meteorological fields in the Chandrapur region of India for 2010, with a view to verify MM5 for use in environment impact assessments and associated air pollution studies. Comparisons were made between field monitored and model generated data on May 20, 2010 in Chandrapur region. Field monitored data was collected using Sodar and Minisonde for estimating wind profile and temperature respectively. Wind rose diagrams were used to compare wind direction and wind speed. Temperature profile form Minisonde was used to determine Mixing height. The surface and upper air files were created for input to AERMET meteorological preprocessor and the model was run to determine atmospheric boundary layer parameters for comparison. Four sets of simulation were carried out for different input variables, using field monitored data and prognostic model generated data. Wind speed, Temperature, Surface Heat Flux, Friction Velocity, Mixing Height and Wind direction were estimated and compared to evaluate the MM5 prognostic model.

Biography

M N V Anil is pursuing MTech in Environment Systems Design and Modeling from CSIR-National Environment Engineering Research Institute, Nagpur, India. He is designated as Trainee Scientist and has completed his BTech from JNTU, Hyderabad in Mechanical Engineering. He has participated in prestigious MIT Media Lab, Design and Innovation Workshop, held at Mumbai, 2014. He has created software for directly converting field monitored parameters to AERMET readable format. His research interests include dispersion modelling, meteorology, biodiversity and waste management. He is currently carrying out his thesis work in Air Pollution Control Division of NEERI, Nagpur.

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