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Analyses on space-time variations of energy and material flow using the synthetic database

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To investigate four dimensional (space-time) structures of the atmosphere it is important to use various types of datasets obtained from the ground and the satellite complementarily. An idea is proposed for the efficient use of these data. In addition to the data sources for conventional meteorological parameters, such as temperature, humidity and wind field derived from regional to global observations and analyses, those for the atmospheric minor constituents would be extensively collected for investigations on the material flow. On the basis of these data sets we will try to analyze i) tropical cloud characterizations, such as locality, height and space appearance, ii) wave generation and its propagation, iii) temperature variations around the tropical tropopause and stratosphere-troposphere exchange, iv) distribution and transport of minor constituents, v) structure and variation of electron density, and so on. Also the high vertical resolution dataset from GPS occultation observations is incorporated particularly over ocean area where the ground based observation is lacking. It is used to investigate fine temperature structures related to the atmospheric gravity waves and changes in electron density in the upper atmosphere. To utilize these datasets synthetically an interactive database system will be constructed for analyzing and visualizing the data. Such a tool facilitates information exchange between researches intimately, and realizes the interdisciplinary understanding.

Keywords: satellite observations, ground based observations, database