

***OBSERVATIONAL-BASED EVALUATION OF CLOUD PROPERTIES IN  
REANALYSES OVER THE SOUTHERN GREAT PLAINS***

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**ABSTRACT**

Cloud properties (e.g., cloud -top/-bottom height and temperature, cloud thickness, cloud optical depth, cloud vertical profile) from the major reanalysis datasets (i.e., ERA-Interim, NCEP/NCAR Reanalysis I, NCEP/DOE Reanalysis II, and MERRA) are evaluated by using surface-based vertically pointing remote sensing observations of the U. S. Atmospheric Radiation Measurement (ARM) program's Active Remote Sensing of Clouds (ARSCL) over the Southern Great Plains (SGP). Model deficiencies in simulating those cloud properties are identified. Potential causes of the model deficiencies are analyzed by using vertical profiles of meteorological conditions (e.g., temperature and relative humidity) from merged sounding observations. Possible consequences of the model deficiencies to modeling the radiation fields and energy budget within a vertical column of the modeled atmosphere are discussed.