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Application of MET for the validation of satellite precipitation estimates

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The goal of this study is to demonstrate the usefulness of the NCAR Model Evaluation Tools (MET) applied to the validation of high-resolution satellite rainfall estimates. MET provides grid-to-point, grid-to-grid, and advanced spatial validation techniques in one unified, modular toolkit that can be applied to a variety of spatial fields (e.g., satellite precipitation estimates). Most validation studies rely on the use of standard validation measures (mean error, bias, mean absolute error, and root mean squared error, etc.) to quantify the quality of the precipitation estimates. Often these measures indicate poorer performance because, among other things, they are unable to account for small-scale variability or discriminate types of errors such as displacement in time and/or space (location, intensity, and orientation errors, etc.) in the precipitation estimates. This issue has motivated recent research and development of many new techniques such as, but not limited to, scale decomposition, fuzzy neighborhood, and object orientated methods for evaluating spatial precipitation estimates. This study will compute statistics for high resolution satellite estimates of precipitation using standard validation measures for the comparison with object orientated measures using the MET built-in Method for Object-based Diagnostic Evaluation (MODE) algorithm using the radar-rainfall estimates as the reference. Rainfall estimates generated by the TRMM Multi-satellite precipitation analysis (TMPA) and CPC Morphing technique (CMORPH) will be used demonstrate the new validation techniques.