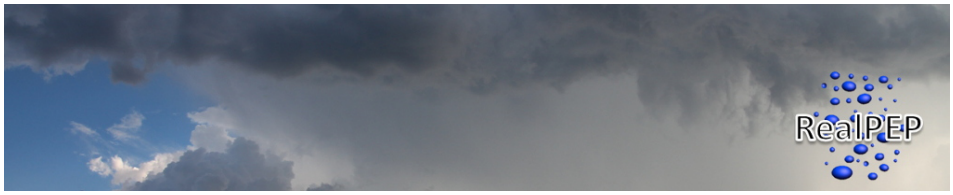

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Scale Characterization and Correction of Diurnal Cycle Errors in Nowcasting

Tuesday, October 6, 2020 10:00 AM (20 minutes)

The most widely used technique for nowcasting of quantitative precipitation in operational and research centers is the Lagrangian extrapolation of the latest radar observations. However, this technique has a limited forecast skill because of the assumption made on its formulation. These assumptions are constant motion vectors and neglection of growth or decay in the precipitation field. In this work, the McGill Algorithm for Precipitation Nowcasting by Lagrangian Extrapolation (MAPLE) errors have been computed for 10 yr of radar composite data over the continental United States. The study of these errors shows systematic bias depending on the time of day. This effect is related to the solar cycle, whose heating energy increases the average rainfall in the afternoon. This external forcing interacts with the atmospheric system, creating local initiation and dissipation of convection depending on orography, land use, cloud coverage, etc. The signal of the diurnal cycle in MAPLE precipitation forecast has been studied in different locations and spatial scales as a function of lead time to recognize where, when, and for which spatial scales the signal is significant. This information has been used in the development of a scaling correction scheme where the mean errors due to the diurnal cycle are adjusted. The results show that the developed methodology improves the forecast for the spatial scales and locations where the diurnal cycle signal is significant.

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