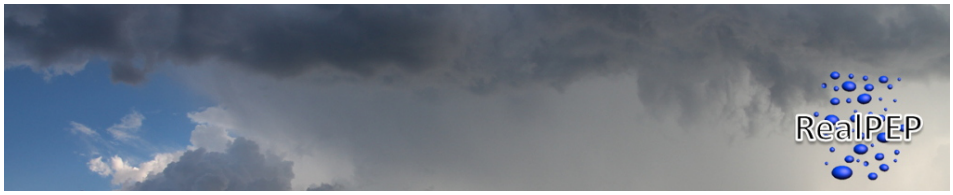

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The synergistic use of polarimetric radar data and one-dimensional microphysical models for precipitation nowcasting

Tuesday, October 6, 2020 3:05 PM (20 minutes)

Dual-polarization radar data can be used to infer a wealth of information about precipitation microphysics. The development and coupling of forward polarimetric radar operators to models has emerged as a popular approach for relating and studying the sensitivity of observed polarimetric signatures to underlying microphysical processes, with the goal of improving microphysical parameterization schemes and nowcasting abilities. This talk will present the latest progress of developing one-dimensional microphysical models informed by polarimetric radar data. Results from a one-dimensional snow model initialized with polarimetric microphysical retrievals demonstrate the potential for estimating melting-layer cooling rates from specific differential phase (KDP), as well as simulating snow sublimation and the accurate prediction of snow start times at the surface in the presence of dry air. In addition, preliminary results indicate the successful incorporation of snowflake aggregation and breakup processes constrained by observed polarimetric radar variable profiles. Finally, applications of a one-dimensional model of melting graupel/hail and comparison with observations will be presented that suggest the potential for early detection of wet microbursts and nowcasting of hailfall swaths.

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