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Alfredo N. Wetzel* (alfredo.wetzel@wisc.edu), **Leslie M. Smith** and **Samuel N. Stechmann**. *Discontinuous Fronts as Exact Solutions to Precipitating Quasi-Geostrophy*.

Atmospheric fronts may be idealized as boundaries between two air masses with different temperature, density, moisture, etc. In this presentation, we discuss exact discontinuous solutions of a simplified model for moist mid-latitude synoptic atmospheric flows: the precipitating quasi-geostrophic (PQG) equations. These simple discontinuous fronts extend the celebrated Margules' front slope formula to the case of propagating moist fronts and require both rainfall and a phase change of water at the front interface to exist. The fronts propagate at speeds related to the rainfall velocity, temperature/wind jump magnitudes, and front geometry. To assess the realism of these fronts, we use rough estimates of relevant physical parameters to show that cold, warm, and stationary fronts are sensibly captured by the model. (Received September 25, 2018)