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Huaqing Cai* (huaqing.cai.civ@mail.mil), Buliding 1622, Headquarters Road, White Sands, NM 88002. *Is there Scale Invariance in Atmospheric Vortices?* Preliminary report.

From hurricanes to tornadoes, atmospheric vortices range in scales from hundreds of kilometers to tens of meters. It is a well-known fact that a power law relationship exists relating the radial velocity, as well as its derived vertical vorticity, as a function of radius in atmospheric vortices. This relationship has been confirmed to exist both from observational data and numerical simulations. The question becomes, what is the relationship between power laws describing, for example, a tornado and its parent mesocyclone, if both types of vortices co-exist simultaneously, as would be the case for a supercell storm containing a tornado? Cai (2005) hypothesized that scale invariance exists between tornado and mesocyclone scale. In other words, given a flow field with multiple vortices in different scales, the same power law in terms of maximum vertical vorticity derived from different scales would hold across all the scales. The scale invariance hypothesis has yet to be fully confirmed or refuted since it was introduced by Cai (2005), which motivated the current study; that is to further test this hypothesis using either available observational or numerically simulated data. In addition, the implications of this scale invariance hypothesis to tornadogenesis will also be discussed. (Received August 26, 2016)