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Organized convection and mesoscale vortices: Implications for coherence of convection in the AMMA region

C. Davis and A. Laing

National Center for Atmospheric Research, P. O. Box 3000, Boulder, Colorado 80307 USA (cdavis@ucar.edu/303-497-8181)

Organized convection often produces mesoscale vortices that outlast the convective system within which they originate. These structures are balanced, to first order, and are primarily a result of mesoscale diabatic generation of anomalous potential vorticity (PV). Evidence exists that topographic generation of vorticity also aids in their formation. Mesoscale Convective Vortices may last for hours or, in cases where new convection organizes within their circulation, these structures may last for more than one day. Convection is largely self-induced and these vortices often acquire characteristics of small-scale baroclinic waves. Over the ocean, MCVs can often be the seed for tropical cyclogenesis.

In this talk, we review statistics of convection over the North American and African regions. These statistics reveal a markedly similar degree of spatial and temporal continuity in the two regions. We show how vortical remnants of deep convection (i.e. MCVs) affect the temporal and spatial statistics of convection over North America. Extension of these ideas to African MCSs is then discussed. The coherence of African convection may be explained to a large extent by MCV formation and propagation along easterly waves. Further, mesoscale convection is more often modulated by moisture convergence along the easterly waves and less influenced by upper-tropospheric baroclinic transient disturbances.