

ABSTRACT

The initiation and location of summer season convective activity, occurring between 1500 and 1800 UTC within a 100 kilometer radius of the Mobile, AL National Weather Service WSR-88D radar site, was examined on days when weak vertical wind shear environments existed. Data were collected during June and July of 1996 based on 1200 UTC analyses of upper air charts, radar and GOES-8 satellite imagery. Thirteen case days were selected for detailed analysis and compositing revealed three distinct synoptic patterns according to the location of mid-tropospheric ridging.

The precise location of initiation was found to be a function of both the 0-1 km base state flow and the extent of the flow's interaction with physiographic features and local sea- and bay-breeze circulations. The modified mean 1800 UTC sounding for case days was characterized by a well-mixed boundary layer, a deep moist adiabatic lapse rate and an overall decrease in relative humidity with height. For all case days, the surface parcel was found to be the most unstable air parcel within the mixed layer. A distinct bi-modal distribution was found to exist in the 0-1 km base state wind flow pattern with flow predominantly east-southeast or west-southwest. Thunderstorms were observed to initiate in a 'mirror-image' pattern on either side of Mobile Bay and was focused near elevation peaks, along the sea-breeze and at or near the orthogonal intersection of the sea- and bay breeze circulations on either side of the Bay.