

Characterization of the in-cloud horizontal wind shear and its relation with cloud morphology using Scanning ARM Cloud Radar Observations

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In the present work, we center our analysis on the spatial and temporal characteristics of in-cloud horizontal wind shear in stratus clouds. We capitalize on measurements collected by the Scanning ARM Cloud Radars (SACRs) at ARM fixed and mobile sites. Particularly, we take advantage of the HS-RHI scan strategy (a sequence of 6 horizon-to-horizon RHI's evenly spaced in azimuth) to retrieve the in-cloud horizontal wind with high spatial and temporal resolution around the site via VAD technique. This wind retrieval in the cloud layer provides a very good insight in the dynamical process involved in cloud evolution. Here, statistics of in-cloud horizontal wind shear, their collocation with spectrum width and its relationship with cloud statistics, such as cloud thickness and mean reflectivity, will be presented. The role of horizontal wind shear in cloud growth is also analyzed in an effort to estimate the role of turbulence in cloud evolution at different heights.