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Abstract: Research aircraft provide unique observations of the micro-physics of ice clouds. The University of North Dakota (UND) has conducted airborne micro-physics research since the 1970's using the Cessna Citation II twin-engine fanjet aircraft. The North Dakota Citation Research Aircraft is now operated by Weather Modification International (WMI) of Fargo, North Dakota. WMI and UND working together provide a platform capable of conducting a wide range of field projects in a cost-effective manner, while providing a unique educational experience for students. The Citation Research Aircraft has a number of design and performance characteristics that make it an ideal platform for a wide range of atmospheric studies, including sampling at high altitude (40,000 ft) which is critical for ice cloud observations. WMI has the experience to install the custom scientific instrumentation required for conducting in-situ observations of ice clouds, while UND provides the scientific knowledge to obtain measurements that achieve the scientific objectives. Recent Citation projects include the measurements of cirrus cloud particles in Florida thunderstorm anvils during 2015 (CAPE2015 field project). During the CAPE2015 field project, ice particles were sampled between an altitude of 29,000 ft and 40,000 ft on eight research flights. In-situ observations were made using a Two-Dimensional Stereographic probe (2D-S) and a Nevzorov Water Content Probe (Nevzorov). Remote sensing observations were made by the United States Navy's Mid-Course Radar (MCR). The MCR tracked the aircraft to obtain high resolution radar reflectivity concurrent with in-situ probes. The concurrency of the observations allows for examination of the variation of radar reflectivity that links cloud micro-physics to the large-scale cloud structure and enables the understanding of cloud evolution over time. A critical component to understanding cirrus clouds is robust software that automates the processing of in-situ probe data. Correctly understanding and processing two-dimensional cloud probe images to generate particle spectra is critical for comparison of in-situ and remotely sensed data.