



## Single Particle Studies of Aerosol / Ice Cloud Interactions

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It has been known for several decades that aerosol particles can nucleate the ice phase, and thus form clouds, via two distinct processes: homogeneous freezing of an aqueous medium and heterogeneous action by solid components known as ice nuclei. A recent emphasis has been placed on conducting field missions to better understand aerosol / ice cloud interactions. These studies, including CRYSTAL-FACE and INSPECT, have greatly increased our understanding of the composition of ice forming particles, and the mechanisms by which they freeze. For example, single particle instruments have shown that ice nuclei originate from a small subset of atmospheric particles and that aerosol composition, namely organic content, affects homogeneous freezing. Episodic events, such as dust storms, have been shown to have a significant effect on cloud properties and may change the mechanism by which freezing occurs. Ultimately, these data may improve our ability to model aerosol / cloud interactions and better predict the effect of anthropogenic perturbations.