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Ablation Ion Source for Cold Chemistry[1] TIMOTHY BURKE, RICHARD MATTISH, JOAN MARLER, Clemson University — Atomic ions isolated in an rf trap and laser-cooled to temperatures in which their internal states can be measured, set, and switched at the individual ion level provide the ideal starting conditions for quantum chemistry experiments. Ablation loading of the rf trap opens up the possibility of a wide range of ion species which could be trapped and sympathetically cooled in the same apparatus without needing to break vacuum. We present a two part loading scheme using ablation to load various target ions and photoionization to load coolant ions into a linear rf trap. At Clemson, near term experiments include first characterizing and refining this loading technique. This system can then be used to study chemistry relevant to astrophysical systems, follow state to state chemical reactions, and perform accurate measurements of carbon containing organic systems.

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