High Spectral Resolution Lidar (HSRL) Measurements of Ice Water Content: Approach and Initial Progress

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Our objective is to demonstrate a new method of remotely determining ice water content in cirrus clouds with the following approach:

First cirrus particle size measurements using multiple field-of-view molecular backscatter

A comparison of the measured multiply scattered molecular lidar return (colored lines) and the model predictions (solid black lines) using an effective radius of 75 microns and γ = 0. The yellow-filled curve shows the HSRL measured backscatter cross section profile in relative units.

The normalized molecular wide field-of-view lidar return is shown as a function of range for the particle effective radius with γ = 0 and molecular backscatter of 0.296 mR, 0.963 mR and 2.2 mR. The backscatter cross section profile of the cirrus cloud on 22-Feb-01 is shown in yellow (relative units).