

Prospects of Measuring Atmospheric Winds with a 2-Micron Coherent Doppler Lidar from the International Space Station

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Abstract: The measurement of global winds in the troposphere is often cited as the most important single missing element of our present weather and climate observing system. The most promising technique for filling this gap is with space-based coherent Doppler lidar. A Space Shuttle mission (SPace Readiness Coherent Lidar Experiment, SPARCLE) is being developed at NASA/MSFC (Huntsville, AL) that will provide the first space-based test of the technique, validating the ability to maintain the severe requirements on optical alignments during launch and space operations, and removing the Doppler shift of the spacecraft velocity and Earth's rotation. Continued development will include a scientific research mission in the mid-2000's, and an operational instrument around 2010. It is anticipated that the International Space Station will be a good candidate as a platform for the scientific research mission (as an attached payload). The need for and value of wind observations, the status and objectives of the SPARCLE mission, and detailed plans for the follow-on missions, including technology development, will be discussed.

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