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Subject: Letter of Support for PolarCube Microwave Radiometer  

The AFRL University Nanosat Program (UNP) asked me to write a letter of support for the UC-Boulder PolarCube CubeSat mission. PolarCube will measure the 118.7503 GHz O₂ resonance at eight channels, primarily for temperature profiling. Because DMSP SSMI/S already uses the 2 cm⁻¹ O₂ fine structure for temperature profile retrieval, the mission seems worthwhile alone based on its attempt to use the separated O₂ absorption line. This work appears sufficiently unique such that it will advance space-based microwave spectroscopy in support of atmospheric characterization and numerical weather analysis.

AFRL is also monitoring an SBIR Phase II proposal that uses advanced numerical data assimilation methods for satellite microwave radiometer measurements associated with cloud properties retrieval in all weather conditions. On this basis, the Polar CubeSat mission fits in with research to improve weather forecasting for the Air Force, such as the Air Force Weather Agency Coupled Assimilation and Prediction System (ACAPS). Drs. Thomas Auligné and François Vandenberghé of the National Center for Atmospheric Research are experts in this field and can be consulted for applications of PolarCube radiance measurements in operational weather prediction.

In summary, this is a very interesting microwave radiometer mission housed in a 3U CubeSat. I believe it is worthy of support based on its scientific merit and the potential for supporting operational weather forecasting. I wish the PolarCube mission team the best in their future endeavors.

Sincerely,

[Signature]

John R. Roadcap  
Air Force Research Laboratory  
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cc: AFRL UNP