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POLARCUBE – A 3-UNIT CUBESAT FOR REMOTE SENSING IN THE 118 GHZ MICROWAVE
FREQUENCY**Abstract**

Abstract PolarCube – A 3-unit Cubesat for remote sensing in the 118 GHz Microwave Frequency
The Colorado Space Grant Consortium at the University of Colorado at Boulder is developing a 3-unit Cubesat for passive remote sensing at the 118 GHz microwave frequency band. The mission of the PolarCube satellite is to perform temperature sounding in the polar atmosphere and surface sea ice/open water imaging to study the effect of open water on polar thermal structure. A secondary purpose is to enhance weather forecasting and to perform temperature measurements over hurricanes. The satellite is based upon the existing 3-unit ALL-STAR bus from Colorado Space Grant Consortium, for which a first version scheduled for launch in March 2014. Besides discussing the overall mission of PolarCube this paper focuses on the payload, “MiniRad”. A rotating 8-cm parabolic offset mirror in a cross-track scan configuration enables imaging at the Nyquist rate, while maximizing the aperture size (and thus the resolution) for the CubeSat form factor. With this configuration, PolarCube will achieve the highest resolution in this wavelength band to date when it is launched in 2015. The PolarCube mission is intended as pathfinder for future passive microwave remote sensing constellations.