

HARP Design and Polarimetric Testing with Target Selection for HARP CubeSat

Noah Sienkiewicz, J. Vanderlei Martins, Xioguang Xu, Roberto Fernandex-Borda, Dominik Cieslak, Brent McBride
University Maryland Baltimore County (UMBC), Joint Center for Earth systems Technology (JCET), Earth and Space Institute (ESI)



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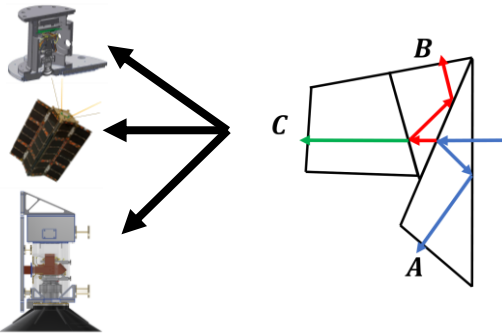


Concept and Design

AirHARP

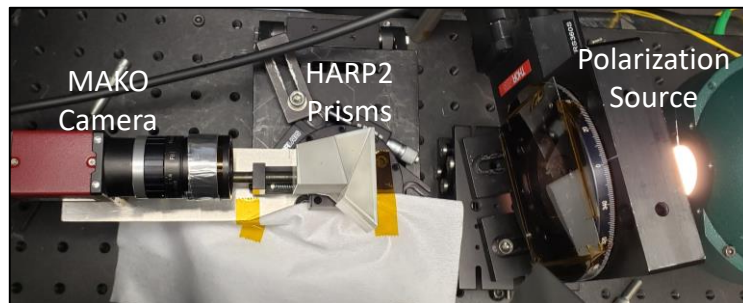
HARP CubeSat

HARP2



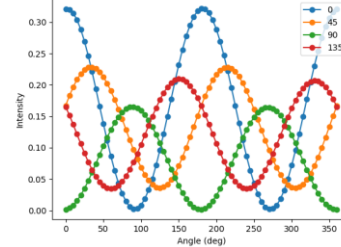
The HyperAngular Rainbow Polarimeter (HARP) is a wide field of view pushbroom polarimeter whose novel design retrieves three of linear states of polarization. ($90^\circ, 45^\circ, 0^\circ$).

Currently, HARP2 is under production at UMBC and laboratory testing of the prism elements and their coatings is being done using the Sony MAKO polarization camera.

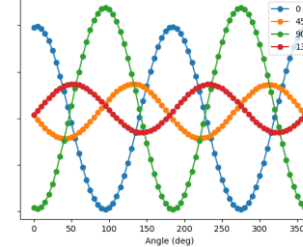


Lab Results

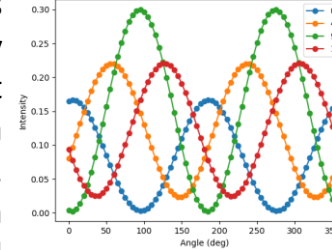
Port A



Port B



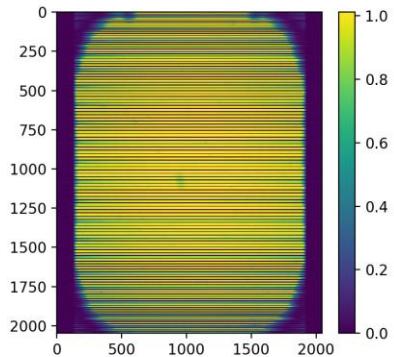
Port C



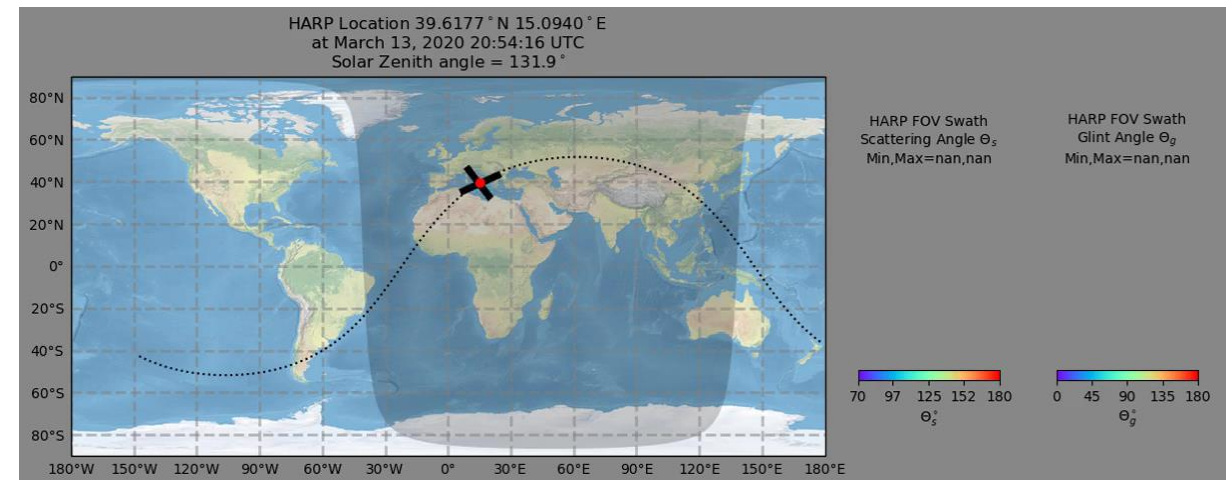
Polarization is generated in the lab by rotating a linear sheet polarizer in front of a diffuse light source. The HARP prism is then tested at each port and the results guide how to situate the final polarizers in front of the CCD camera yet to be placed. This test is necessary to ensure the quality of the anti-reflection and splitting coatings applied.

Processing and Future Work

Raw HARP imagery shows the stripe filter pattern for the 4 HARP wavelengths: 440, 550, 670, and 870 nm which are concatenated from one image to the next, line by line to create single angle "pushbrooms"



The HARP CubeSat was just recently launched into orbit at around 415 km. We're actively tracking it and are preparing target imagery based on estimations of scattering geometry for clouds and aerosols.



Additional Information: <https://esi.umbc.edu/>, <https://sites.google.com/umbc.edu/harp/home>