

The Gold Cubesat Idea

Introduction

Ultraviolet and extreme-ultraviolet on-orbit instrumentation deteriorates very quickly after launch. It is believed that on-orbit instrument degradation is caused by contaminants degassing from the spacecraft surface. The main culprit is likely water that is dissociating under ultraviolet irradiation, causing oxidation of filter and/or detector surfaces. One way to test this hypotheses would be to build a pair of small satellites, based on the cubesat standard: Both cubesats would house the same filter-radiometers based on AXUV photodiodes and metal foils. However, one of cubesats would have all exterior surfaces plated with gold. Water cannot adhere to gold it should greatly reduce the contaminants on the surface.

Proposal

To make this a useful experiment, we propose to build two equal cubesats carrying the exact same instrumentation. One of the cubesats will have all exterior surfaces and as much of the interior coated with gold to reduce contamination.

- Quad-photodiode for alignment
- AXUV photodiode with a bare aluminium filter
- AXUV photodiode with an aluminium filter covered with carbon on both sides
- AXUV photodiode covered with hydrated silicon on both sides (This idea goes back to Charlie Tarrio, e.g. [doi :10.1088/1742-6596/902/1/012024](https://doi.org/10.1088/1742-6596/902/1/012024))