Maintaining a Healthy CubeSat: Analysis of MinXSS FM-1 Data and Preparations for FM-2

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The Miniature X-ray Solar Spectrometer (MinXSS) is a CubeSat built for the NSF and NASA in order to take spectra in the solar soft X-ray (SXR) spectrum in order to observe how solar emissions vary in the SXR and how those variations affect Earth's upper atmosphere. MinXSS Flight Model 1 (FM-1) was launched in May 2015 and will be in orbit for about six months, and MinXSS Flight Model 2 (FM-2) will be launched in the fall of 2016 and could operational for up to five years. Analysis of data from the FM-1 mission, including temperatures, power generation and consumption, and voltages, as well as lessons learned from operating FM-1, can be used to determine the health of FM-1 and can help identify problems with the CubeSat that need to be addressed on FM-2 prior to launch. Some questions addressed in this presentation include: are the FM-1 subsystems staying within their operating temperature ranges and is there sufficient power capacity to operate MinXSS for an extended mission in its science mode? These analyses ensure that FM-1 and 2 will remain healthy and functioning as expected for the duration of their missions.