

A status update on the Southern Hemisphere Meteoroid Measurements

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Hypervelocity meteoroid impacts, either from the sporadic background or meteor showers, are a risk to NASA spacecraft operations. Mitigation of the meteoroid impact risk can be accomplished by implementing spacecraft designs that minimize the threat to critical systems, operational changes to the spacecraft orientation during mission operations, or a combination of both. Knowledge of the meteoroid threat in terms of mass-dependent flux (both rate and direction) is required in order to best implement the mitigation strategies.

The Meteoroid Environment Office (MEO) assesses the risk posed to space assets by naturally occurring meteoroids, either from the sporadic background or meteor showers. However, most of the models used are based on monitoring the meteoroid environment in the Northern Hemisphere and only partially the Southern Hemisphere, leaving some potential threats without means to be monitored. NASA Goddard Space Flight Center (GSFC), Space Science Mission Operations (SSMO), and NASA, Johnson Space Center (JSC), International Space Station (ISS), Vehicle Integrated Performance, Environments, and Resources (VIPER) requested NASA Engineering Safety Center support to

- Upgrade an existing monitoring facility to provide the required data from the Southern Hemisphere. The facility would leverage from an existing infrastructure supported by other programs and agencies.
- Conduct a meteoroid survey in the Southern Hemisphere, in particular during the period of the expected 2019 outburst of the Beta Taurid Meteor shower
- Calibrate the radar data with optical observations to complement existing monitoring facilities in the Northern Hemisphere and thus provide the required meteoroid fluxes and mass indices in the mass range pertinent to MEO's mission.

In this paper, we present a status report of this effort.