



Lessons learned from operating a heliophysics mission Science Data Center

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The NASA Magnetospheric MultiScale (MMS) mission launched in March, 2015. In the four years since then, the Laboratory for Atmospheric and Space Physics (LASP) at the University of Colorado, Boulder, has operated the Science Data Center (SDC) for the mission. The SDC has the primary responsibility for processing, distributing, and preserving the mission data from each of the twenty-five instruments on all four spacecraft. To date, the mission has produced nearly 150TB of data which we have offered to the heliophysics community through the SDC website and tools.

Operations plans for the MMS SDC were developed in the years prior to launch. Since then, advances in computing environments have changed how we operate. Additionally, as with any active mission, the SDC has adjusted to the needs of the mission science team, particularly with regards to supporting the mission-critical Scientist-in-the-Loop component.

This talk will highlight the modifications and adjustments, both evolutionary and functional, that the SDC has made during four years of operations. This includes the transition from physical server hardware to a new virtual machine architecture, improved data management practices that are continually improving and adjusting to community needs, and processing automation to adjust for extended mission budget reductions. Additionally, we look to the future of large Science Data Centers and hope to provide insight into how best to operate them for complex missions with a variety of time-critical roles that are applicable to future earth observing and planetary missions.