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Stratospheric Aerosol and Gas Experiment III limb scatter observations from the International Space Station

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This paper discusses a lesser known mode of the Stratospheric Aerosol and Gas Experiment (SAGE) instrument anticipated to be installed on the International Space Station (ISS) in the near future. The SAGE III instrument destined for ISS is actually one of three identical units built just before the turn of the century. Similar to its ancestors, the SAGE III can perform accurate and precise solar occultations (SOs), as demonstrated during a 5-year mission onboard a Russian Meteor 3M satellite launched in Dec. 2001. Compared to earlier models, the SAGE III instrument has greater spectral coverage, the ability to perform lunar occultations and record light scattered from the sunlit atmosphere (aka limb scatter, LS). Excellent for monitoring the stratosphere, the 51.8 deg. inclined orbit of the ISS causes the latitude of the $\sim$30 SO events per day to sweep-out near global coverage each month. Though restricted to the daylight portion of the ISS orbit, on any given day LS measurements can be taken over a range of latitudes complimenting the SO locations. After a brief review of salient SAGE III/ISS payload and instrument features, this paper presents: a summary of LS observations with the SAGE III/M3M model, the plans for SAGE III/ISS LS observations, how this LS data will complement the ISS occultation measurements, ways the LS data will augment and inform analysis of LS observations from other sensors, and how the SAGE III/ISS mission will respond to episodic events such as volcanic eruptions and relevant science needs.