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SAGE III/ISS aerosol/cloud categorization and its impact on GloSSAC

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The Stratospheric Aerosol and Gas Experiment (SAGE III/ISS) aboard ISS began its mission in June 2017. SAGEIII/ISS is an updated version of SAGEIII-Meteor instrument that makes observations of stratospheric aerosol extinction coefficient at wavelengths that range between 385 and 1550 nm with a near global coverage between 60S-60N. While SAGEIII/ISS makes reliable and robust solar occultation measurements in stratosphere—similar to its predecessors, interpreting aerosol extinction measurements in the vicinity of tropopause and in the troposphere have been a challenge for all SAGE measurements. Here, we study the challenges associated with the discrimination of aerosols and clouds from the extinction measurements. Additionally, recent volcanic/PyroCb events make it more challenging to separate aerosols from clouds. Here, we describe the methods implemented to categorize Clouds and aerosols using available SAGEIII/ISS aerosol measurements. Cloud categorization is developed based on a method proposed by Thomason and Vernier (2013) with some modifications that now incorporates the influence of recent volcanic/PyroCb events and a new method of locating aerosol centroid based on k-medoid clustering. We use version 5.2 of SAGE III/ISS extinction coefficients for the analysis. The current algorithm now classifies standard (background) and non-standard (enhanced) aerosols in the stratosphere and identify enhanced aerosols and aerosol/cloud mixture in the tropopause region. Extinction coefficient measurements from SAGE series of observations make an important contribution in the GloSSAC data base and therefore, the impact of cloud-filtered aerosol extinction coefficient measurements on the latest version of GloSSAC (version 2.1) is also discussed.