



Combining ship-borne, airborne and early Southern Hemisphere ground-based lidar measurements with global model predictions to improve early phase dispersion in an improved aerosol extinction datasets for the 1991 Mount Pinatubo aerosol cloud

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We revisit the original SAGE-II and lidar gap-filling volcanic aerosol datasets in the initial months following the Pinatubo eruption. During that period, the lower stratosphere was so optically opaque making impossible for SAGE II to conduct reliable measurements. We make use of five lidar datasets for that period we have compiled from research teams. None of these datasets were used for gap filling in the most recent stratospheric aerosols climatology. The Aspendale ground-based lidar measurements in the southern hemisphere were made throughout the 2nd half of 1991, also measuring the depolarization of the plume from early 1992. Two ship-borne lidar from the Russian vessels Prof. Zubov ship Atlantic transect from Europe to the Caribbean July to September 1991 and Prof. Vize ship transect from Europe to south of the Equator between January and February 1992. Two NASA airborne lidar missions. NASA-Electra Aircraft Missions to the Caribbean on July 12, 13 and 14 1991 and NASA-Ames Aircraft Mission to the Pacific to the Pacific on May 24 and 26 1992.

We present preliminary analysis of these datasets and will combine them with ensemble of simulations with the UM-UKCA interactive stratospheric aerosol model and identify best fit to the measurements retaining also the fine-scale spatial and temporal evolution of the volcanic aerosol cloud. The activity aligns with a new “data rescue” activity in the 2nd phase of the SPARC initiative “Stratospheric Sulphur and its Role in Climate” (SSiRC). We will make the lidar datasets available to the scientific community in a public repository via the SSiRC website.