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Interactive comment on "Variability and evolution of mid-latitude stratospheric aerosol budget from 22 years of ground-based lidar and satellite observations" *by* Sergey M. Khaykin et al.

M. Fromm

mike.fromm@nrl.navy.mil

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I have a question regarding Figure 4. The plot surprised me because it did not show Sarychev Peak aerosols in the full altitude range of the eruption's impact. See Jegou et al. (http://www.atmos-chem-phys.net/13/6533/2013/) and their Figure 6. See a Sarychev layer at ∼22 km in mid-July. Jegou et al. did not bring attention to this feature, but it is real. The OHP NDACC Rayleigh lidar data for July 2009 reveal a strong aerosol peak at ∼22 km on 16 July. This profile does not show up in Figure 4. My question is why did this layer show up in Jegou's OHP analysis and not in the current paper? How consistent is the NDACC OHP lidar archive with respect to the data presented in this paper?

It seems to me that your paper has an opportunity to draw attention to this previously unreported aspect of the Sarychev eruption: injection heights exceeding 20 km. The 20+ km aerosol is fully evident in CALIPSO data as well. Expedited imagery shows the high aerosols over France during this time frame. Here are 2 CALIPSO slices from the time of the OHP sighting: https://www-calipso.larc.nasa.gov/products/lidar/browse_images/show_detail.php?s=production&v=V3-01&browse_date=2009-07-16&orbit_time=01-35-53&page=1&granule_name=CAL_LID_L1-ValStage1-V3-01.2009-07-16T01-35-53ZN.hdf https://www-calipso.larc.nasa.gov/products/lidar/browse_images/show_detail.php?s=production&v=V3-01&browse_date=2009-07-17&orbit_time=02-19-06&page=1&granule_name=CAL_LID_L1-ValStage1-V3-01.2009-07-17T02-19-06ZN.hdf Here's a shot of the high aerosol a couple weeks earlier, over Asia, before it got to Europe. https://www-calipso.larc.nasa.gov/products/lidar/browse_images/show_detail.php?s=production&v=V3-01&browse_date=2009-06-30&orbit_time=21-23-20&page=1&granule_name=CAL_LID_L1-ValStage1-V3-01.2009-06-30T21-23-20ZN.hdf

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