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# Stratospheric Smoke to Rival Volcanic Sulfate: the pyroCb Plume of 2017

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On 12 August 2017 a cluster of pyrocumulonimbus (pyroCb) storms erupted in and near British Columbia. This event directly injected biomass burning aerosols and gases into the stratosphere, and various satellite measurements have shown the emissions to be extremely large and possibly unequaled. These measurements exhibited an assortment of saturation issues and confounding signals. For example, GOME2, OMI and OMPS UV absorbing aerosol index values increased for several days in the core of the smoke plume. Profilers such as CALIPSO reached total attenuation in a stratospheric smoke layer. Limb profilers such as OMPS/LP effectively saturated 3-10 km above the tropopause. In some regards the British Columbia pyroCb plume rivaled volcanic sulfate plumes in terms of hemispheric mass, spread and altitude.

This pyroCb plume also rivals some volcanic clouds in other ways. By one month after injection the plume was observed at altitudes within the Junge layer: 25 km ($\Theta$ $\sim$600 K). At times the summertime plume was observed upwind, over, and downwind of the Asian Summer Monsoon region, a known source/pathway for troposphere-to-stratosphere transport. Considering these factors, this event stands as strong example of a non-volcanic pathway into the lower stratosphere that may contend with medium volcanic eruptions for its stratospheric aerosol perturbation potential.

We will analyze this pyroCb event with an assortment of satellite and ground-based aerosol and gas measurements to characterize the mass, spread, persistence, and radiative impact of this powerful example of a recurring non-volcanic source of perturbed atmospheric composition.