



## **Glyoxal observation from Sentinel-5 Precursor - First evidence of long range transport from Canadian wildfires**

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Glyoxal (CHOCHO) is an intermediate product in the atmospheric oxidation of most volatile organic compounds (VOC) and an indicator of secondary organic aerosol (SOA) formation in the atmosphere. It is mainly emitted by natural sources but there also is a significant contribution from human activities and fires. Glyoxal is characterized by a short life time (few hours) in presence of sunlight, because it is removed from the atmosphere by photolysis, SOA formation, oxidation by OH, as well as by physical processes such as wet and dry deposition. CHOCHO can be retrieved from space-borne observations using the Differential Optical Absorption Spectroscopy (DOAS) method. Here, measurements from the TROPOMI instrument, which was launched on the Sentinel-5 Precursor (S5P) platform in October 2017, are used for the observation of glyoxal.

Previous studies show unexpectedly high amounts of glyoxal over ocean regions, where no sources of glyoxal are expected. Also, as consequence of its short lifetime, long range transport of glyoxal is unlikely. However, in this study some evidence of transport of glyoxal produced from fire emissions was identified over the Canadian region, indicating possible recycling processes in the plume.

During summer 2018, large wildfires occurred in Canada's British Columbia region. These fires create elevated atmospheric levels of many different gases in the atmosphere, e.g. CO, NO<sub>x</sub>, O<sub>3</sub>, SO<sub>2</sub>, CO<sub>2</sub>, HCHO, CHOCHO and aerosols affecting air quality. For many of the fires, glyoxal hot spots can be identified in the measurements. Surprisingly, elevated levels of glyoxal remain visible for several days and over long distances from the sources until they disperse. The glyoxal S5P observations, in combination with forward trajectories simulated with the FLEXPART model, are used to investigate the glyoxal long range transport during the study period. FLEXPART simulations describe the evolution of the plume of glyoxal for most of the fire events, and provide estimates of the effective life time of glyoxal in the plumes.