Halocarbons Observations in the Himalaya

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The Himalayas and the Tibetan Plateau (HTP) is a vast geographic area, covering ~ 5 million km^2 and an average altitude of more than 4000 m (a.s.l) located between South and East Asia, two emission hot spots for several anthropogenic species, including the ozone-depleting (ODSs) and radiatively active halocarbons. Despite its crucial location, HTP is an under-sampled region with sparse measurements. Here we report the results from two field campaigns carried out in April and May 2022 at the Nepal Climate Laboratory-Pyramid station (27.95°N, 86.82°E, 5079 m a.s.l., NCO-P) in the high Khumbu valley, on the southern side of the Mt. Everest and at Mt. Everest (Qomolangma) base camp (28.19°N, 86.83°E, 5010 m a.s.l), respectively. During the campaigns, flask samples were collected, and 36 halocarbons were measured through Gas Chromatography-Mass Spectrometry. A comparison between the results from the 2022 campaigns and data from a monitoring programme running during 2008-2013 at NCO-P are also presented. The dominant ODSs exhibited a declining trend, reflecting the effectiveness of the Montreal Protocol. On the other hand, a large increase in HFCs and a high abundance of unregulated chlorocarbons (e.g., CH_3Cl) is shown.

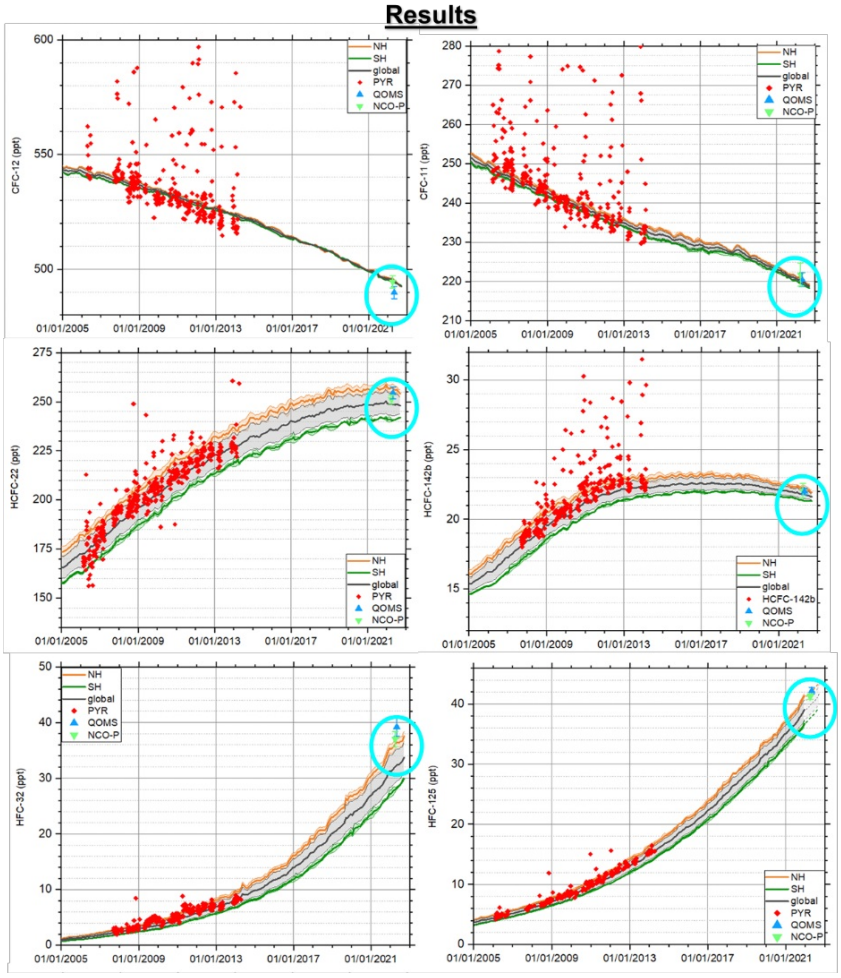

Figure 1. Halocarbons in the Himalayas and comparison with global, Northern Hemisphere and Southern Hemisphere average values