20 Years of ClO Measurements in the Antarctic Lower Stratosphere

- G. Nedoluha, B. Connor, et al, acp-2016-188 – discussions
- 20 years of (1996-2015) of austral springtime measurements of ClO over Antarctica from the ChlOE1 ground-based millimeter wave spectrometer at Scott Base, Antarctica; 12 years (2004-2015) of ClO measurements from MLS
- To study interannual differences, we focus on a 3-week period from August 28 to September 17 for each year, and compare the average column ClO anomalies
- Anomalies are shown to be highly correlated with the average ozone mass deficit for September and October of each year
- Anomalies in column ClO are strongly anti-correlated with 30 hPa temperature anomalies, both on a daily and an interannual timescale
- We calculate the linear dependence of the interannual variations in column ClO on interannual variations in temperature, then
- Estimate the underlying trend in the total chlorine (Cly = HCl + ClONO₂ + HOCl + 2×Cl₂ + 2×Cl₂O₂ + ClO + Cl) which provides the reservoir for the ClO
- The resultant trends for zonal MLS, Scott Base MLS (both 2004-2015), and ChlOE (1996-2015) were -0.5±0.2% yr⁻¹, -1.4±0.9% yr⁻¹, and -0.6±0.4% yr⁻¹, respectively