



MAX-DOAS observations at Penlee Point Atmospheric Observatory, South England

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For almost one year MAX-DOAS observations were performed at the Penlee Point Atmospheric Observatory close to Plymouth, South England, in order to quantify abundances of reactive halogen species (RHS) and their potential impact on diurnal ozone observations. The observatory is located directly at the coast at the entrance of the Plymouth sound. Thus, the measurements mostly probed air masses from the open ocean, which are potentially influenced by coastal emissions. Depending on the wind direction, the observations are also influenced by urban pollution from the city of Plymouth and by shipping emissions from the sound and the English Channel. NO₂ and HCHO were clearly detected. No significant absorptions above the instrumental detection limit (DL) of 1 ppt (BrO) and 0.6 ppt (IO) were observed. Also Glyoxal could not be detected above the DL of 20 ppt. SO₂, HONO and OCIO were also not observed above the respective DL. The data set is suitable also to show a series of general properties for the spectral retrieval of MAX-DOAS data. We show estimates for the O₄ absorption bands at cross-section around 328nm and 419nm, which were usually not considered in the past and can in turn improve the spectral retrieval in the wavelength range used for BrO and HCHO significantly. Thus, reduction of BrO and HCHO DL of typically 35% could be achieved. The long term measurements also show that the used recently available commercial MAX-DOAS allow high quality measurements like expensive custom-made instruments. The performance of the instrument will be presented.