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Ozone observations at Sodankylä using Brewer spectrophotometer and ECC ozonesondes

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Ozone measurements have been made at Sodankylä (67.4° N, 26.6° E) since late 1980s. Here we report observations made by a Brewer spectrophotometer and ECC ozonesondes, including long term observations and results from intercomparison campaigns at the site. The Brewer instrument used in this study is of Mark II type and has a serial number #037. In Sodankylä Brewer direct sun measurements are possible between February and October due to the high latitude location. We have compared Brewer total ozone measurements with ozonesonde observations. In general we find good agreement between sonde and Brewer measurements. During campaign measurements the Brewer/sonde ratio has been 1.00.

Ozone soundings have been made once per week on regular basis since the first years of the observations. In addition to the regular measurements several satellite validation campaigns and the ozonesonde Match project have increased the frequency of the soundings. At Sodankylä the change in ozonesonde type occurred in early 2006. Since then we have flown EN-SCI and DMT type of electrochemical concentration cell (ECC) ozonesondes with 0.5 % KI sensing solution and the sonde preparation procedure has not been changed. Dual soundings confirm that change in sonde type does not cause inconsistency in the ozonesonde data set in our case. From dual soundings, using various sonde preparation methods, it is possible to derive transfer functions to correct the long term time series of ozonesondes, in case of changes in operational practices. Regarding the sonde comparisons with satellite borne (MLS and OMI) profile retrievals we find positive bias above 10 hPa of altitude and a small negative bias at around 30 hPa. Sonde total ozone comparisons with OMI total ozone columns have shown an excellent agreement.