



An estimation of Arctic ozone loss in recent winters based on assimilation of EOS/MLS and SBUV observations

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Arctic lower stratospheric temperatures were cold enough during the winters 2004/05 and 2006/07 to sustain substantial PSC formation. In 2004/05, the winter-mean PSC volume was the largest on record. While inferred ozone loss was very high, the methods to estimate bulk, vortex-averaged ozone loss are still crude in accounting for horizontal mixing across the vortex edge and inhomogeneous descent, or in establishing a proper reference “inert” ozone. Here, we assimilate EOS/MLS and SBUV ozone observations into the UK Met Office assimilation system, and calculate Arctic ozone loss, with the aim of better accounting for the effect of horizontal mixing and preserving spatial ozone loss in-homogeneities in the polar vortex. The assimilating model is similar to the operational, GCM-based system, and hence assimilate dynamical observations using a 3D variational method. We estimate vortex-averaged ozone loss, and compare our inferred ozone loss with estimates based on observations and model studies (CTM) with full stratospheric chemistry.