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Investigation of Arctic ozone depletion sampled over midlatitudes during the Egrett campaign of spring/summer 2000

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Abstract. A unique halocarbon dataset has been obtained using the Australian high altitude research aircraft, the Grob G520T Egrett, during May-June 2000 with GC instrument (DIRAC), which has been previously deployed on balloon platforms. The halocarbon data generally shows a good anticorrelation with ozone data obtained simultaneously from commercial sensors. On 5 June 2000, at 380K, the Egrett entered a high latitude tongue of air over the U.K. CFC-11 and O₃ data obtained on the flight show evidence of this feature. The dataset has been used, in conjunction with a 3D chemical transport model, to infer ozone depletion encountered in the midlatitude lower stratosphere during the flight. We calculate that ozone is depleted by 20% relative to its winter value in the higher latitude airmass. A suite of ozone loss tracers in the model have been used to track ozone depletion according to location relative to the vortex and chemical cycle responsible. The model, initialised on 9 December, indicates that 50% of the total chemical ozone destruction encountered in June in the middle latitudes occurred in the 90-70°N equivalent latitude band and that 70% was due to halogen chemistry.

▣ [Final Revised Paper](#) (PDF, 1026 KB) ▣ [Discussion Paper](#) (ACPD)

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