

Potential effects on ozone of future supersonic aircraft/2D simulation

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Abstract. In a previous work, the stratospheric effect of a future supersonic aircraft fleet on ozone has been simulated, by using a photochemical diffusive 1D model and a 2D photochemical, radiative dynamical model. The fleet scenario was defined by Aerospatiale and Snecma for a current technology Mach-2 aircraft; the models were limited to simplified homogeneous phase reactions. The results indicated a global ozone decrease of about 1.5% in steady-state conditions. Now the 2D model has been upgraded and includes the classical heterogeneous reactions with Polar Strato- spheric Clouds (PSC) and aerosol. It also takes into account the natural or anthropogenic evolution of the background atmosphere. The scenario has been optimized to meet more realistic conditions. Thus, new results are presented. The main conclusion concerning the calculated impact of a realistic fleet for the next 20-50 years is still weaker than in the previous work: the decrease for the total ozone would always be lower than 0.3%. These results are commented, with the help of a parametric study, pointing out the importance of the background atmosphere and especially the total chlorine loading and the aerosol surface area.

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