This is a pure data paper, not a modeling paper. I have no way of removing volcanic effects from the data. The point of the paper is for models to include all chemistry and dynamics effects including volcanic aerosols to see if the results match the data in the sense of an asymmetric T_A. As pointed out in the paper, a latitude and time-dependent T_A has little effect on the trends. Current models do not show a variable T_A as a function of latitude. The models all show T_A = 2000.

I have added material about models and the SPARC-5 report.

In the Introduction:

A comparison of several atmospheric chemistry and dynamics model studies as part of the Chemistry-Climate Model Validation (CCMVal) Activity (Eyring, et al. 2010a, their Fig. 1; Dhomse et al., 2018; Robertson et al., 2023) generally predict an ozone turnaround date T_A in the year 2000 with no systematic latitude dependence. In particular, Robertson et al. (2023) shows latitude dependence of long-term ozone recovery, but T_A = 2000 for all cases. Quoting from the Sparc Report No. 5 (Eyring, et al. 2010b), "Common systematic errors in CCM results include: tropical lower stratospheric temperature, water vapor, and transport; response to volcanic eruptions", which may affect the determination of T_A as a function of latitude and time. The results of this study may provide a convenient metric for model validation compared to ozone data T_A.

In the Summary:

An examination of model studies that are part of CCMVal shows a nearly uniform T_A = 2000 that suggests that the several models' chemistry and dynamics including volcanic effects are incomplete.