

Analysing Chemical Pathways in Planetary Atmospheres

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We apply a new tool called the Pathway Analysis Program which identifies and quantifies atmospheric chemical pathways for a given species of interest. The tool which is unique in planetary science helps deepen our understanding by identifying which key chemical processes are responsible for changes in chemical abundances based on output from atmospheric climate-chemistry models. We have already successfully applied our Pathway Analysis Program to the Earth and to Mars where it has identified novel chemical pathways affecting e.g. ozone and carbon dioxide respectively. We plan to apply our tool to the Venus atmosphere to shed light on the complex chemical pathways which are believed to control the main atmospheric constituent CO₂, believed to proceed via potentially complex cycles involving chlorine-, nitrogen- and hydrogen-oxides, as well as sulphur oxidation cycles which could affect aerosol formation hence impact Venusian cloud formation processes.