

Observations of planet and satellite atmospheres and surfaces with FIRST

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The exploration of the submillimeter range by FIRST will open new prospects for the study of planetary and satellite atmospheres and surfaces. Four main themes can be envisaged. (i) new measurements of the abundances of deuterium and helium in the atmospheres of the Giant Planets will provide improved constraints on their origin and evolution (ii) the observation of water in the upper atmospheres of the Giant Planets and Titan will give further insight in the source of external water in the Outer Solar System (iii) the search for new atmospheric compounds will improve our understanding of chemical and physical phenomena governing atmospheric composition. Significant progress, in particular, is expected on the tropospheric composition of the Giant Planets and on the martian photochemistry (iv) the photometric, thermal and compositional properties of planetary and satellite surfaces (Mars, Giant Planet satellites, Pluto/Charon, some bright TNOs). Current knowledge on these aspects will be reviewed and the expected promise of FIRST discussed.