

## Search of CH<sub>4</sub> on Mars by SOFIA/EXES

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Discovery of CH<sub>4</sub> in the Martian atmosphere has led to much discussion since it could be a signature of biological/geological activities on Mars. However, the presence of CH<sub>4</sub> and its temporal and spatial variations are still under discussion. We performed sensitive measurements of Martian CH<sub>4</sub> by using the Echelon-Cross-Echelle Spectrograph (EXES) onboard the Stratospheric Observatory for Infrared Astronomy (SOFIA) on 16 March 2016, which corresponds to summer (Ls = 123.2°) in the northern hemisphere on Mars. The high altitude of SOFIA telescope (~13.7 km) enables us to significantly reduce the effects of terrestrial atmosphere, and the high spectral resolution of EXES (R~90,000) enables us to detect the intrinsically narrow lines of Martian CH<sub>4</sub> at the 7.5 μm band. . Mars disk was spatially resolved into 3 x 3 areas, none of the observed region showed the unambiguous detections of CH<sub>4</sub>. The upper limits on the CH<sub>4</sub> volume mixing ratio ranges from 1 to 6 ppb.

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