

火星周回探査機搭載用サブミリ波サウンダ FIRE の観測装置の紹介 Introduction to the submillimeter receiver system for the atmospheric emission sounder FIRE/MELOS

菊池 健一^{1*}, 佐川 英夫¹, 黒田 剛史², 笠井 康子¹, 落合 啓¹, 西堀俊之³, 真鍋武嗣⁴, Paul Hartogh⁵, Joachim Urban⁶, Donal Murtagh⁶

KIKUCHI, Kenichi^{1*}, SAGAWA, Hideo¹, KURODA, Takeshi², KASAI, YASUKO¹, OCHIAI, Satoshi¹, Toshiyuki Nishibori³, Takeshi Manabe⁴, Paul Hartogh⁵, Joachim Urban⁶, Donal Murtagh⁶

¹ 情報通信研究機構, ² 東北大学大学院理学研究科, ³ 宇宙航空研究開発機構, ⁴ 大阪府立大学, ⁵ Max Planck Institute for Solar System Research, ⁶ Chalmers University of Technology

¹NICT, ²Tohoku University, ³JAXA, ⁴Osaka Prefecture University, ⁵MPS/Germany, ⁶Chalmers Univ./Sweden

The Far-Infrared Experiment, FIRE, is a submillimeter-wave atmospheric emission sounder proposed as an onboard scientific instrument of the future Japanese Mars exploration orbiter MELOS. The FIRE submillimeter receiver will consist of 500-GHz, 600-GHz, and possibly lower frequency band receivers, to observe the submillimeter emission from the Martian atmospheric minor species and surface.

FIRE will provide unique and powerful data set in the synergy between FIRE and other instruments of MELOS. The high sensitive submillimeter receiver enables measurement without solar light, will allow us to study the local time dependency of Martian parameters. Moreover, since the submillimeter wave is more transmissive than UV, optical, and IR against the typical dust particles, FIRE will bring us information of field, such as temperature, inside of the dust.

One of the challenges to develop the FIRE instruments is to realize a lightweight and low-power consumption to meet with the limited resources of planetary exploration spacecraft. As part of this effort, we are going to develop a lightweight antenna optics made of carbon fiber instead of the conventional aluminum. This paper briefly introduces the FIRE receiver system and strategy of observation.

キーワード: 火星, MELOS, サブミリ波サウンダ

Keywords: Mars, MELOS, FIRE, submillimeter-wave sounder, receiver