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PPS001-P04 会場:コンベンションホール 時間:5 月 27 日 14:00-16:30

InSb 赤外撮像装置電気回路系の開発
Development of the electronics for an infrared camera with InSb array

北見 拓也 [1*], 坂野井 健 [1], 宇野 健 [1], 市川 隆 [1], 笠羽 康正 [1]
Takuya Kitami[1*], Takeshi Sakanoi[1], Takeru Uno[1], Takashi Ichikawa[1], Yasumasa Kasaba[1]

[1] 東北大学大学院・理学研究科
[1]Graduate School of Science, Tohoku Univ

We present the current status of development of the electronics on our infrared imaging camera with InSb 256x256 array. Infrared remote sensing of planetary atmosphere is one of the most powerful measurement tools to understand the dynamical and chemical processes in the atmosphere since there are many emission and absorption lines in the near-infrared range (1-5 um), and the solar flux becomes smaller compared to visible range. Further, it is essential to carry out continuous measurement with our own instrument since it is necessary to clarify the time variation of those phenomena with long-term data. In particular, we aim to clarify the Jupiter's H_3^+ auroral response to solar wind variation with statistical approach. We are therefore developing our own 1-5um infrared

imager. This imager has a 256x256 InSb array detector, a field of view is 110arcsec with a F12 telescope with a plate scale of 0.43arcsec/pixel. In the case of 3.4um Jovian H3+ auroral measurementg, we estimate S/N of the acquisition of data to be about 33 with 1 minute exposure using 60cm?/F12? telescope.

In this presentation, we focus on the electronics to control the detector. Functions of the electronics are summarized as follows. [1] Generating the timing of three kinds of clocks, selecting horizontal vertical lines and reading the frame of the detector. [2] Converting it into the voltage that adjusted an above clock timing to the detector. [3] Constant voltage (Bias) generation . [4] The amplification of the detector output, and A/D conversion.

To satisfy the function [1] we adopt the digital circuit system with FPGA (Field-Programmable Gate Array) and one-board computer which had a characteristic of incorporated Linux. Concerning on the functions [2] [3] [4], the analog circuit system are used .

This camera will be installed on the 60 cm telescope of Iitate observatory, Tohoku University, and other overseas facilities, and used to monitor the Jupter's H_3^+ aurora.