

Parallel Distributed Processing of Plasma Waveform Using Science Cloud

KASAHARA, Yoshiya^{1*} ; YAGI, Daisuke¹ ; MURATA, Ken T.² ; GOTO, Yoshitaka¹

¹Kanazawa University, ²National Institute of Information and Communications Technology

Measuring waveform of plasma waves by scientific satellites is one of very important methods for understanding the physical processes in space plasma. It is quite difficult to extract and study characteristic wave phenomena using waveform data manually, because the data amount of waveform is too large. We have tackled for many years on automatic detection algorithm to extract varieties of characteristic waveforms in a systematic way. In order to analyze the waveform data properly, however, many computation time is necessary for the signal processing for noise reduction and filtering and many turnarounds are indispensable to brush up the algorithm.

In the present study, we evaluate a parallel distributed processing technology implemented in the NICT Science Cloud using our original program for the automatic detection of bipolar pulses measured by the waveform capture (WFC) onboard the KAGUYA spacecraft. We introduce a task scheduler named Pwrake (Parallel workflow extension for Rake) for the parallel processing. We demonstrate that Pwrake is a suitable task scheduler for hetero-type tasks.

In the presentation, we report the current results and also new science outputs expected from our trial.

Keywords: Parallel Distributed Processing, Science Cloud, Plasma Wave, Signal processing, Waveform analysis