

## The study of the small and lightweight system about the wave particle correlator

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Wave particle correlator, which is another technique of applications of the waveform measurements, have not been used in the missions in Japan.

This instrument can observe wave-particle interactions by calculating cross correlation functions between obtained waveforms and detected particles on board.

We performed computer simulations in order to examine the function and data quality of the wave particle correlator and found that the correlation between the waveform and particle velocity distribution in the linear stage and non-linear stage of the wave-particle interaction is different from each other.

Wave particle correlator was conventionally realized by hardware. Additionally, the poor count rate of the particle detector causes the low time resolution.

In the present study, we also studied the new design of wave-particle correlator for the next spacecraft exploring the magnetosphere tail region.