

## Preliminary analysis of HAYABUSA-2' s Doppler-Shift

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The school previously analyzed the data received for one day during Hayabusa2' s first Earth swing-by and found that the received frequency was Doppler-shifted. We concluded that this was caused by the change in relative motion between Hayabusa2 and the Earth due to the Earth' s rotation. On the occasion of Hayabusa2' s return, we were able to obtain much longer reception data than that mentioned above, including three days the re-approach and nine days after it started to move away from the Earth. Not only the large effect of the Earth' s rotation, but we also challenged the quantitative analysis of the relatively small effect on the Doppler shift caused by the change in the relative motion between the orbital motion of the Earth and that of Hayabusa2.