

## M32a X線ジェット velocities over time

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Magnetic reconnection as a mechanism for X-ray jets. One model is that two X-ray jets with different velocities exist (Shibata et al. 1992). One is accelerated by magnetic tension to Alfvén speed (500-1000 km/s) and the other is formed by chromospheric evaporation with sound speed (~200 km/s). However, in the statistical study of X-ray jets using 'Yohkoh'/SXT data, most of the X-ray jets have velocities below sound speed (Shimojo et al. 1996, 2000). 'Yohkoh'/SXT has a high resolution and a relatively low temperature coronal sensitivity. 'Hinode'/XRT has a new observation from Cirtain et al. (2007) that X-ray jets with sound speed flow contain Alfvén speed flow (or wave). However, their report is based on 4 event analyses and it is not clear whether the velocity structure is a general feature or not. In this study, we investigate whether X-ray jets have Alfvén speed flow or not, and also investigate the formation process of Alfvén speed flow in the X-ray jets. We investigate the time evolution of the velocity of X-ray jets in the polar region.

We investigate the X-ray intensity images from 10 polar X-ray jets and investigate the time evolution of the velocity. The results are as follows. 1) In the previous study, the velocity structure is not only one event but also multiple events. 2) In 10 events, Alfvén speed flow structure is found in 6 events. 3) Sound speed flow structure and Alfvén speed flow structure are found in the same event, but sound speed flow structure appears first. From these results, we discuss the formation process of the velocity structure in X-ray jets.