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The MAXI mission on the International Space Station

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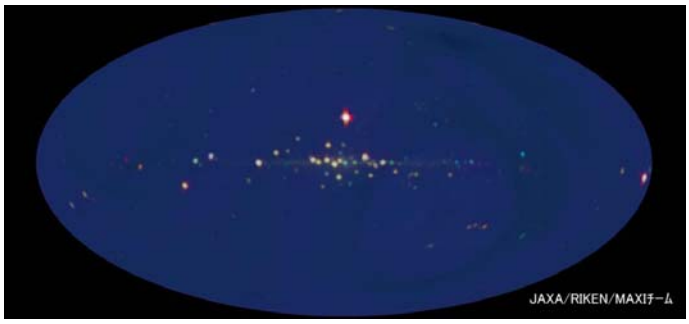

The Monitor of All-sky X-ray Image (MAXI) mission is the first astronomical payload installed on the Japanese Experiment Module - Exposed Facility (JEM-EF or Kibo-EF) on the International Space Station (ISS). MAXI was transported by Space Shuttle, and started the observation on Aug 2009. The size of MAXI is about 2x1x1m, and the weight is about 500kg. The system resources of the electronic power (400W), data communication between MAXI and ground system (MIL1553B : 20-40kbps, Ethernet : 200-600kbps), heat transfer(liquid loop in 20degree), and attitude control are provided by ISS system.
MAXI has two types of X-ray camera. One is Gas Slit Camera (GSC), which employees gas proportional counters. GSC has large area for X-ray detection (>5000cm**2) and position resolution of about 1mm for 8keV X-rays. Another X-ray camera of MAXI is Solid-state Slit Camera (SSC). SSC includes 32 X-ray CCDs for the X-ray detection. SSC covers 0.5-10keV. The energy resolution of SSC is 150eV at 5.9keV (FWHM). MAXI can determine the position of X-ray object with accuracy of 0.1 degree for bright sources using star sensor and gyroscope. The X-ray detection time is determined with accuracy of 0.1 msec for each X-ray events using Global Positioning System (GPS).
The main objective of the MAXI observation is to search for transient phenomena in X-ray sky and to alert astronomers to the discovery. About 70% of the MAXI data is transferred in real time from ISS to the ground system. The remaining 30% data is also transferred in several hours. Although the MAXI is still in performance verification phase, MAXI made about 20 prompt reports on transient phenomena for the 5 month observation. The distribution of MAXI data was also started at RIKEN web site (http://maxi.riken.jp), where we can see light curves of about 100 X-ray objects. Source number will be planed to be increased to about 1000. The animation of X-ray sky obtained by MAXI can be also seen at MAXI web site, which shows us the variability in hot universe. MAXI has also capability to conduct spectrum analysis. For example, we would be able to determine the temperature of accretion disks at various state of XTE J1752-223, which is a new black hole candidate discovered 2009 showing many time visibilities. The above figure exhibits the all-sky image obtained by MAXI.

Keywords: X-ray, proportional counter, CCD, interrnational space station, astronomy, observation