

SUMMARY

STARS-AO (Space Tethered Autonomous Robotic Satellite - **Astronomical Observation**) is a one unit (1U) cube sat, of dimensions (10 x 10 x 10 cm³) size. STARS-AO is a satellite from the Autonomous robotic satellites family in Prof Nohmi's Laboratory, but as mentioned it is a single unit cube sat which does Astronomical Observation. Stars-AO has a sensitive monochrome camera which can observe stars from earth without long-time exposure. Therefore, if we take photos of stars from space through this satellite, we can observe stars more clearly because there are few airs. It also transmits the observed data to the ground station comparatively faster than normal satellites image data transmitting speed. The Power sources using for STARS-AO are 5 solar panel units and 2 Li-ion batteries. These solar panels are arranged on all sides of the satellite except camera side. The Actuators in STARS-AO are 3 Magnetic Torquers arranged in each axis and utilizes earth's magnetic field to control the attitude of the satellite.

STARS-AO has two missions as follows: Astronomical observation by sensitive camera and High-speed transmission for image data.

- Astronomical observation

Once Stars-AO is put into desired orbit initially it deploys the antenna to transmit and receive the commands. Then according to the command from ground station it observes the desired Stars in space by a **Sensitive Monochrome Camera** and takes the photographs.

- High-speed transmission

Usually the Image data is larger than any other housekeeping data, so it takes too long time to downlink the data by using transmitter. The previous STARS satellites utilized the same kind of transmitters. Therefore, Stars-AO has a **high-speed transmitter** for image data after taking the pictures of stars very clearly it transmits the data with high speed to the ground station.