

## **ASTE: The Atacama Submillimeter Telescope Experiment**

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The Atacama submillimeter telescope experiment (ASTE) is a Japanese project to operate a 10-m submillimeter telescope in the high altitude site at 4,800 at Atacama desert in northern Chile. The project is aimed to explore the southern sky with submillimeter waves at 300 - 900 GHz, as well as to study and develop instruments or observing methods for submillimeter observations.

The telescope was shipped to Chile and mounted at the current site in 2002. Following the evaluation and testing phase including detection of CO (J=7-6) emission at 807 GHz, we have started the spectroscopic observation at 345 GHz to detect various emission lines including CO (J=3-2) or CS (J=7-6) through various astronomical objects. The highlights from the latest results, and its technological progress as well as the brief history and the future plan of the project will be presented in the talk.

The main reflector of the 10-m telescope has an excellent surface accuracy within 19 microns r.m.s, together with good pointing accuracy. The electrical actuators mounted on each 205 surface panels of the main reflector realizes easy and fast surface adjustment following the surface measurement employing holography method.

Several receivers were tested on board in the early phase operation in Chile: SIS receives at 100 GHz to 800 GHz, and a bolometer at 350 GHz to 850 GHz. These receivers provided the first chance to observe astronomical radio waves 800 GHz at the Atacama site. A SIS receiver at 345 GHz with cartridge type plug-in cryogenics is currently in operation which shows an extremely good performance with receiver noise temperature of 120 K.

The spectrometer is an array of 4 XF type digital auto-correlators, each with spectral channels of 1024 and frequency resolution of 31.25 kHz. The bandwidth can be either 512 MHz or 32 MHz for each autocorelator, which covers 750 km/s at 810 GHz.

The telescope is capable of remote operation through the network connection. The telescope site is connected via satellite link between San Pedro de Atacama (alt. 2400 m) and Universidad de Chile in Santiago, with further connection to Japan through the internet. This enables us to observe and operate the telescope under much easier and comfortable condition from sites with low altitude. The entire telescope site is powered by two set of generators, located at the telescope site, as well as several safety equipments including oxygen compressors and satellite phones.