

## Thermal Observations of Trans-Neptunian Objects and Extra-Kuiper Belts with ASTE/ALMA.

# Tomohiko Sekiguchi[1]

[1] Radio Astronomy Division, NAO

<http://www.nro.nao.ac.jp/~tsekiguc/>

The Atacama Submillimeter Telescope Experiment (ASTE) is a Japanese project of the 10-meter submillimeter antenna in the Atacama desert of northern Chile. It is a Japanese pilot project of ALMA. We here discuss on (1) thermal observations of Trans-Neptunian Objects (TNOs) and (2) Extra-Kuiper Belt (EKB) Disks with ASTE and the future project, ALMA.

The effective observable wavelengths of the bolometer which is being developed to be install into ASTE are in the atmospheric windows of 850, 450 and 350 micron bands (350, 650 and 850 GHz). The continuum detector in the high frequency bands (submillimeter wavelength) allows us to observe thermal emissions from cold objects and dusts such as TNOs and debris disks. The observation plans to derive the size and effective temperature of TNOs and to estimate of dust mass in extra Kuiper disks are discussed.

Because of the faintness and smallness, even the most basic parameters of TNOs such as size and albedo are poorly known so far. Most of current studies to obtain the physical properties are to measure their reflected light of the solar radiation in optical and near-IR. On the other hand, cold minor bodies emit their thermal radiation from themselves in the mid-IR/submillimeter wavelength range. The method to obtain their size and albedo is examined.

Next, we discuss on the observation plans to estimate of dust mass in extra-Kuiper disks. This study aims to obtain the size distribution of TNOs, the fraction of existence of debris dusts around solar analogue stars, and to estimate of total mass of Kuiper belt and extra-Kuiper belts.