16th International Workshop on Low Temperature Detectors
20 24 July 2015

# Development of Octave-band Planar Ortho-Mode Transducer with MKID for CMB B-mode Observations

**Main author:**

SHU Shibo

**Co-authors:**

Agnes Dominjon, National Astronomical Observatory of Japan
Karatsu Ken'ichi, National Astronomical Observatory of Japan
Naruse Masato, Saitama University
Nitta Tom, Tsukuba University
Noguchi Takashi, National Astronomical Observatory of Japan
Sekiguchi Shigeyuki, The University of Tokyo
Sekimoto Yutaro, National Astronomical Observatory of Japan
Sekine Masakazu, The University of Tokyo
Shan Wenlei, Purple Mountain Observatory
SHU Shibo, The University of Tokyo

For cosmic microwave background B-mode observation, we describe a design of broadband horn coupled planar orthomode transducer (OMT) with Microwave Kinetic Inductance Detector (MKID). In our design, 90 and 150 GHz frequency bands are covered in single pixel. Silicon-on-insulator (SOI) wafer has been selected for planar OMT and a broadband coplanar waveguide 180-degree hybrid is used to cancel higher mode signals of circular waveguide. After microstrip bandpass diplexer, a microstrip line to coplanar waveguide transition structure is used for coupling signal to MKID. A 4-pixel module is under test and we plan to deploy these multi-chroic polarimeters on Nobeyama 45-m telescope.