



Contribution ID: 341

Type: **Oral Presentation**

## Updated design of CMB polarization experiment satellite LiteBIRD

*Wednesday, July 24, 2019 11:45 AM (15 minutes)*

Recent developments of transition-edge sensors (TESes), based on extensive experience in ground-based experiments, have been making the sensor techniques matured enough for their application possibilities on future satellite CMB polarization experiments. LiteBIRD (Lite (Light) satellite for the studies of B-mode polarization and Inflation from cosmic background Radiation Detection) is in the most advanced phase among such future satellite plans, targeting its launch in 2027 with JAXA H3 rocket. It will accommodate more than 4000 TESes in focal planes of reflective low-frequency and refractive medium-and-high-frequency telescopes in order to detect a signature imprinted on the cosmic microwave background (CMB) by the primordial gravitational wave predicted in inflation. The total wide frequency coverage between 34 GHz to 448 GHz enables us to extract such weak spatially spiral polarization patterns through the precise subtraction of our Galaxy's foreground emission by using spectral differences among CMB and foreground emissions. Telescopes are cooled down to 5 Kelvin for suppressing thermal noises and contain polarization modulators with transmissive half wave plates at individual apertures for separating sky polarization signals from artificial polarization and for mitigating from instrumental  $1/f$  noises. Passive cooling by using four-layered V-groove helps active cooling with mechanical coolers as well as adiabatic demagnetization refrigerators. We are planning to carry out sky observations from the sun-earth Lagrangian point 2 for three years. International collaboration among Japan, US, Canada, and Europe is sharing their roles, and we are now in process of final down selection for JAXA's large-class mission. We will present the most updated design of this LiteBIRD in the present paper.

### Less than 5 years of experience since completion of Ph.D

N

### Student (Ph.D., M.Sc. or B.Sc.)

N

**Primary author:** SUGAI, Hajime (Kavli IPMU (WPI), University of Tokyo)

**Presenter:** SUGAI, Hajime (Kavli IPMU (WPI), University of Tokyo)

**Session Classification:** Orals LM 004

**Track Classification:** Low Temperature Detector Applications