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Far-infrared 160 μm Survey by Balloon-borne Telescopes

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We have initiated a Japan-India collaborative project of far-infrared survey of star-formation regions using balloon-borne telescopes.

We will use two telescopes for observations.

One is a 50 cm Japanese telescope equipped with a newly developed two-dimensional array of stressed Ge:Ga detectors. With this telescope, we will carry our photometric survey of 160 μm continuum with an angular resolution of $1.5'$ and a detection limit of 10 Jy.

The other is TIFR 1 m telescope equipped with a Japanese Fabry-Pérot spectrometer in its focal plane.

With this telescope, we will survey the [C II] 158 μm spectrum line with a spatial resolution of $1.4'$ and a detection limit of 3×10^{-5} ergs s^{-1} cm^{-2} sr^{-1}.

Our objectives will be galactic star-formation regions as well as near-by external galaxies. Combining the observational results by these telescopes, we will attempt to reveal the energy balance between interstellar gas and dust.

We will make first observational flights of these telescopes in this coming winter. During one observational flight, up to 100 square-degrees of the sky will be mapped in 160 μm continuum and 1 square-degree of the sky will be surveyed in 158 μm [C II] line emission.

In this presentation, we will discuss the expected scientific outcomes of this project.