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On the Thermal Inertia and Physical Properties of (1162) Larissa and (1911) Schubart, Tracers of Solar System Evolution

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Abstract

Small bodies such as asteroids are leftovers of the formation of the Solar system, consequently, the study of their physical properties gives us essential clues on the primordial conditions when it was formed.

Among the asteroids, Hildas are one of the least studied of all families in the main asteroid belt region, nevertheless they are relevant for Astrophysics due to their being tied to the migration of Jupiter in the early Solar system, which in turn is a key variable for the habitability of our planetary system.

Using data obtained from the Faint Object infraRed CAmera of the SOFIA Airborne Telescope (FORCAST) instrument, we carried out one of the first studies of the thermal inertia and physical properties of two relevant Hildas, the bright (1162) Larissa, and (1911) Schubart, the largest. Having these outcomes, we would be able to make a contribution in understanding to what extent the Hildas are either captured by Jupiter or formed in-situ asteroids.

A bespoke code written in Python was used to perform aperture photometry on the mid infrared images, integrating libraries as Photutils and Astropy.

The results provided by this first round of analysis for SOFIA FITS deliver interesting doubts on the shape of the asteroids, and are a contribution in constraining asteroid values as size, rotation period and albedo.

Figures

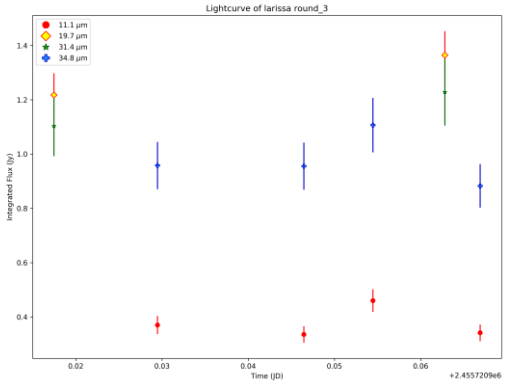

Figure 1: Larissa light curve flux vs time. Final outcome after have applied the developed bespoke code in Python for the data obtained. All observations were high-quality data used to build the light curve

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