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Herschel Observations of a Newly Discovered UX Ori Star in the Large Magellanic Cloud¹

GEOFFREY CLAYTON, Louisiana State University

The LMC star, SSTITISAGE1C J050756.44–703453.9, was first noticed during a survey of EROS-2 lightcurves for stars with large irregular brightness variations typical of the R Coronae Borealis (RCB) class. However, the visible spectrum showing emission lines including the Balmer and Paschen series as well as many Fe II lines is emphatically not that of an RCB star. This star has all of the characteristics of a typical UX Ori star. It has a spectral type of approximately A2 and has excited an H II region in its vicinity. However, if it is an LMC member, then it is very luminous for a Herbig Ae/Be star. It shows irregular drops in brightness of up to 2 mag, and displays the reddening and “blueing” typical of this class of stars. Its spectrum, showing a combination of emission and absorption lines, is typical of a UX Ori star that is in a decline caused by obscuration from the circumstellar dust. SSTITISAGE1C J050756.44–703453.9 has a strong IR excess and significant emission is present out to 500 μm . Monte Carlo radiative transfer modeling of the SED requires that SSTITISAGE1C J050756.44–703453.9 has both a dusty disk as well as a large extended diffuse envelope to fit both the mid- and far-IR dust emission. This star is a new member of the UX Ori subclass of the Herbig Ae/Be stars and only the second such star to be discovered in the LMC.

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