

The Phoebe Ring as observed by Herschel

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Planetary rings of Solar System bodies were known to exist within a few radii of their host body. Verbischer et al. (2009) used the 24- μm and 70- μm Spitzer MIPS observations in order to scan regions near the orbit of Saturn's outer moon, Phoebe, and they discovered a dust feature, observed as a double-peak of light with several characteristics consistent with grains spread into a ring. The extent of the ring was estimated as being from at least 128 to 207 Saturn radii. That work motivated Kennedy et al. (2011) to attempt to detect the Saturnian irregular satellite dust cloud by using the same 24- μm Spitzer measurements. They concluded that the signal is present, but it is consistent with the Saturn's PSF. Assuming dust grains with blackbody temperature of $T = 88$ K, they reported an upper limit of dust surface area equal to 2.9×10^7 km². The PACS photometer camera of the Herschel Space Observatory scanned Phoebe and its surroundings at all three PACS bands (70, 100 and 160 μm). We attempt to analyse and characterise the extended far-IR emission and the basic physical properties of the emitting dust grains.

References: A. J. Verbischer et al., Saturn's largest ring. *Nature*, 461, 2009; G. M. Kennedy et al., Searching for Saturn's dust swarm, *MNRAS*, 417, 2281, 2011.