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What determines the inner sizes of protoplanetary disks?.

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Abstract

Dust particles do not survive temperatures > 1500 K, for which all protoplanetary disks should be cleared of dust close to the central stars. The size of such inner dust holes should be larger for more luminous (hotter) sources, but have angular scales of milliarcsec even for the closest young stars. Thus, they can be resolved only from near-infrared interferometry. This poster summarises our work in Marcos-Arenal et al. 2021, A&A 652, A68, where we inferred inner disk sizes of young stars based on GRAVITY/ESO-Paranal Interferometer observations. We presented the most complete "size-luminosity diagram" of optically-visible young stars. Although the overall trend relating both parameters is confirmed, there is significant scatter. We tested the three main hypotheses aiming to account for the observed size-luminosity relation and its scatter: the presence or absence of large amounts of inner gas, alternative accretion mechanisms, and the different dust disk properties based on spectral energy distributions. None of these scenarios serve as a general explanation, and the origin of the size-luminosity relation and its scatter remains an open question. Future observations avoiding underlying trends with the distance are proposed, which may help to better understand what determines the inner sizes of protoplanetary disks.

My poster is available at https://zenodo.org/record/7023467#.Y5LzcNLMKUl