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Spatially resolved carbonaceous dust infrared emission in proto-planetary disks around Herbig Ae/Be stars

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In the interstellar medium (ISM), the carbon (nano-)grains are a major component of interstellar dust. This solid phase is more vulnerable to processing/destruction than their silicate counterparts. It exhibits a complex, size-dependent evolution due to photon interactions, which provides a modeling challenge. How these micro-physical processes work under the extreme conditions found in disks (different from the ISM by orders of magnitude in terms of excitation and local gas density)? Nano-grains could play an essential role in the gas heating, and thus could have a major influence on the disk structure and its evolution. Moreover, due to their large effective surface area, they could play a key role in the formation of molecules. Finally, they are the tracers of the physical conditions (excitation, extinction, geometry).
I will present an analysis of infrared ground-based data, obtained with VLT/NACO in the 3-4 micron range (which includes aromatic, olefinic and aliphatic bands), for disks around intermediate mass stars (e.g., HD100546, HD100453, HD169142, HD179218). I will discuss what band ratios and parameters tell us on: dust composition, evolution and renewal at the disk surface. At last, I will propose a first comparison between observations of disks which are dense phases and The Heterogeneous dust Evolution Model for Interstellar Solids (THEMIS) developed at the IAS (Jones A. P. et al., A&A, 602, A46 (2017))

Consider for a poster?

Yes

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