

High-resolution ALMA and NIR Imaging of Protoplanetary Disk around T Tauri star

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Protoplanetary disks have a wealth of substructures such as gaps/rings structures, spiral arms, and asymmetries. Multi-wavelength observations can reveal the dust distributions of different grain sizes, which will give us information to discuss the origin to produce such disk structures. This presentation focuses on T Tauri star HP Cha system (distance: ~190 pc; age: ~2 Myr) observed in submillimeter wavelengths and near infrared. Our submillimeter observations were conducted with ALMA at Band 6 to detect the dust continuum and CO gas isotopes (project code: 2017.1.01460.S). In addition, we obtained the scattered light from the disk with SPHERE IRDIS DPI (Dual-Polarization Imaging) mode in J band, and searched point-like sources by using SPHERE IFS in YJH band (program ID: 0102.C-0561). The 1.3 mm continuum image (beam size: 53 mas x 30 mas) first revealed a ring-disk structure with the width of ~0.1 arcsec (~19 au) at the radius of ~0.27 arcsec (~51 au), while the polarized light was detected within ~0.23 arcsec (~44 au). The results would indicate the clear evidence of dust filtration in HP Cha disk. We will discuss the detail properties and origins of observed dust distribution. It is noted that there is no point-like source around HP Cha except known companions.

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