Observations of T Tauri stars with infrared interferometry

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Palomar Testbed Interferometer

- Visibility amplitude measurements
  - K band
  - 2 baselines: 110 and 85 meters
  - Data presented as calibrated and normalized squared visibility (unresolved object has $V^2 = 1$)
T Tauri stars

- Pre-main sequence solar-mass stars
- Ages $10^6 - 10^7$ yrs
- Characteristics
  - Hα emission
  - infrared excess
  - Li abundance
  - X-ray emission
- Many thought to have circumstellar disks

HH 30 disk and jet

T Tau

- Well-studied source in Taurus (d ~ 140 pc)
- Visibility measured for T Tau N component (origin of millimeter emission)
- Accretion disk model predicts higher $V^2$ (smaller size) than measured
SU Aur

- averaged by hour angle (points)
- Gaussian brightness distribution (line)
  - PA = 127° ± 5°
  - inclination = 61° ± 3°
  - 1±0.05 mas (FWHM)
  = 0.14 AU

- Also larger than predicted by SED model
Conclusions

• K band emission from these circumstellar disks has a size scale of ~0.2 AU
  – larger than predicted by accretion disk models

• Current work: deriving circumstellar disk parameters using this data + other wavelengths

• Future work
  – Additional sources at PTI
  – KI, VLTI