EVOLUTION FROM PROTOPLANETARY TO DEBRIS DISKS

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1. DISK EVOLUTION

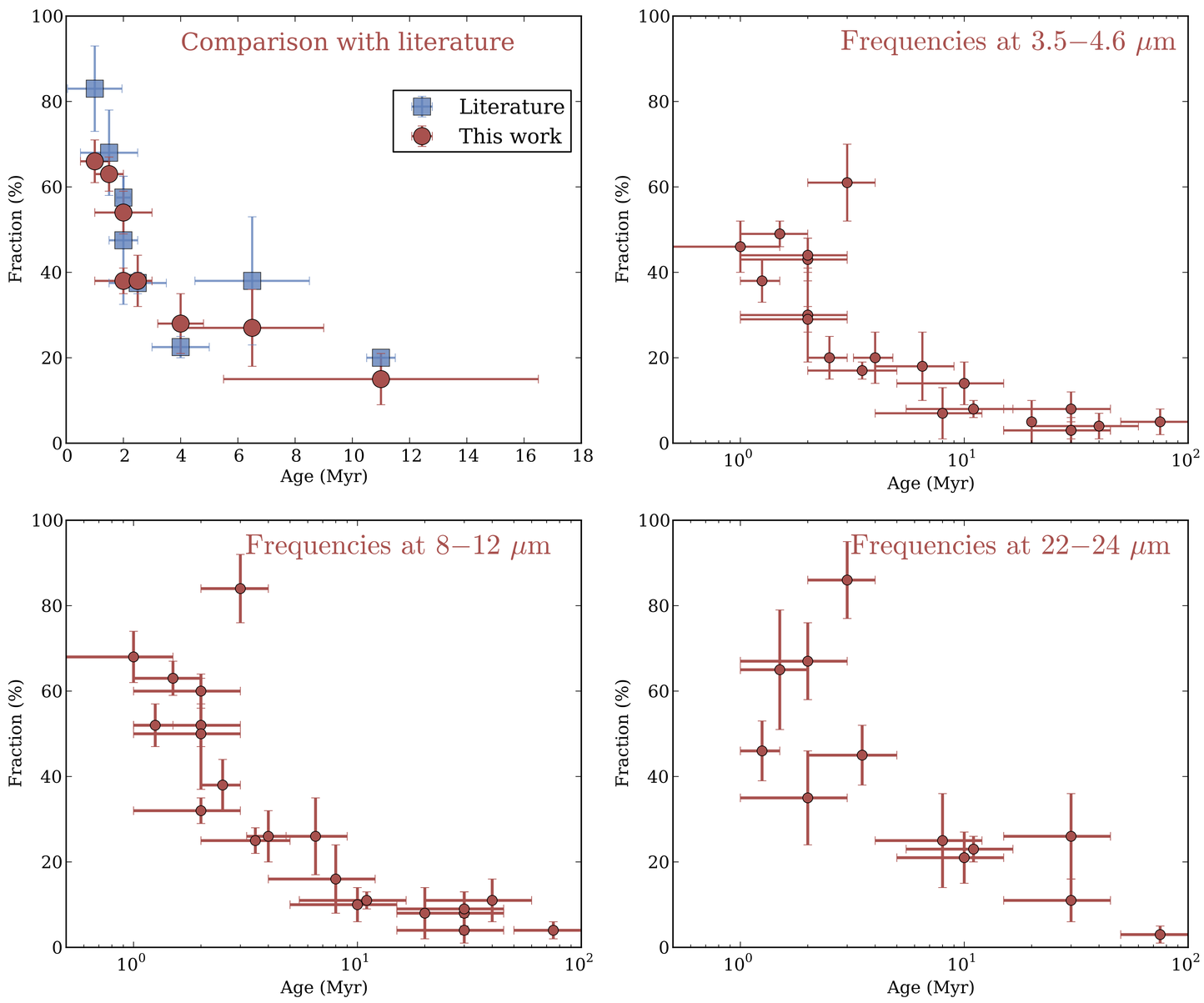
Protoplanetary disks play a key role in star and planet formation. We have compiled a large sample of confirmed YSOs from 21 nearby (<400 pc) young star-forming regions and associations with 1<age<100Myr, and derived accurate disk frequencies in a consistent and homogeneous way for all of them.

2. THE SAMPLE

The sample is made of 2307 spectroscopically confirmed members with accurate photometry from the optical to the mid-IR (*Spitzer* and/or WISE). We built and cleaned the SEDs, and derived disk frequencies, probed by mid-IR excess, as a function of 3 wavelengths domains: 3.5-4.6, 8-12, and 22-24 microns, corresponding to zones of increasing radius/depth within the inner disks.

3. RESULTS

1. The disk frequency decay depends on the wavelength. As expected, the inner regions (probed by shorter wavelengths) disappear faster than the outer regions (probed by longer wavelengths). A single disk decay time is therefore not enough to describe disk evolution.
2. There is no discontinuity in disk frequencies between protoplanetary and debris regimes.



Top left: comparison of disk fractions from this work (red) with previous values in the literature (blue). Top right & bottom: disk fractions derived at 3.5-4.6, 8-12 and 22-24 microns. Disk fractions are systematically higher for longer wavelenghts.

4. PERSPECTIVES

The unique size and quality of the sample will allow us to study disk evolution as a function of stellar mass and environment, providing new insights on circumstellar disk and planetary evolution. Special attention will be given to transitional disks, which are privileged targets for the study of planets.

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