Search for the Inner Disk Structures in "Transitional" Disks

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We present the ALMA archival search efforts for the discovery search for the inner disk structures in transitional disks. Transitional disks are the class of protoplanetary disks that have inner cavity. Recent discovery of the inner (a few AU scale) ring structures in the DM Tau disk (Kudo et al. 2018, ApJL, 868, L5) indicates that even if there is no detection of near infrared (NIR) excess in SED, the disk may still harbor an inner disk within a known large cavity structures. Such inner disk structures are important in understanding (extrasolar) planet formation since a few AU corresponds to the scale of the orbits of the planets within our Solar System.

A few AU region from the central star can be only probed by high resolution observations with ALMA. Such region is too cold to account for NIR excess while modest resolution (~0.2asec) radio observations can still not resolve the region at the typical distance (~140 pc) of protoplanetary disks.

We have conducted ALMA archival search for the potential transitional disk targets that may harbor inner disks. We present the methods of our search and possible candidates that deserve follow-up ALMA high resolution observations.

Keywords: Protoplanetary Disk, Radio Astronomy

