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Chemistry in the disk around TW Hya

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Abstract. We present 1″–4″ aperture synthesis observations of the circumstellar disk surrounding the nearby young star TW Hya in the multiple transitions of CO/^{13}CO/C^{18}O, HCO$^+$/DCO$^+$, HCN/CN and H_2CO obtained with the Submillimeter Array. Rigorous comparisons of the molecular images with 2D Monte Carlo models have been used to constrain the global disk properties including the inclination angle, disk radius etc., using the Chi-square analysis within the visibility domain. Molecular fractional abundances are derived to set the constraints in chemical processes within the disk e.g. the deuterium fractionation, fractional ionization and photochemistry including the self-shielding of the CO gas.

Keywords. astrochemistry, planetary systems: protoplanetary disks, submillimeter