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A Hydrocarbon Rich Atmosphere in the Closest Planet Forming Disk?

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There is mounting evidence from sub-millimeter wavelength observations of protoplanetary disks that their compositions are not interstellar, at least in a handful of disks. Understanding why this is, when it happened, and the magnitude of variations from interstellar composition are essential for determining what planets may inherit from their parent disk. We report results from the TW Hya Rosetta Stone Project, a program designed to map the chemistry of common molecules at 15 au resolution in the nearby TW Hya disk. In this presentation, I will discuss our analysis of the resolved c-C3H2 observations acquired as part of this program, combined with archival data, together comprising a multi line analysis of both ortho and para spin isomers. We find a highly super solar C/O disk atmosphere best fits the data. We will discuss potential physical and chemical mechanisms for the enhanced carbon chemistry, as well as implications for planets forming out of this disk system.