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Complex organic chemistry toward young stars

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The origin of life remains a fundamental question in many scientific fields. From an astrochemical perspective a key element to understanding this question is through the formation and evolution of complex organic molecules (COMs) as they are thought to constitute the precursor for the building blocks of life. Methanol (CH_3OH) is one of many COMs detected in the interstellar medium and is of particular interest due to its simplicity and high abundance. Furthermore, methanol is thought to be the starting point for creating more complex molecules. However, its optical depth varies significantly and as such, this must be considered when interpreting results. This work aims at producing synthetic spectra of methanol observed throughout the hot corino of the isolated core B335. We ultimately find that some of the methanol lines become optically thick at different depths in the core, meaning that the implementation of both a temperature and density gradient is necessary to accurately reproduce a realistic scenario when creating the synthetic spectrum. This model can then be applied to further studies of protostellar systems, such as those observed in the newly accepted large ALMA program, COMPASS –a systematic and unbiased survey of several protostellar regions.

Field of study

Astrophysics

Supervisor

Jes K. Jørgensen

Primary author: LÜTZEN, Martine (University of Copenhagen)

Session Classification: Poster session: Enjoy the posters!!!