

# Absorption studies along the line of sight towards Sgr B2

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Even 68 years after the discovery of the first interstellar molecule, CH, by optical spectroscopy, the chemistry of diffuse clouds remains poorly understood. Standard chemical models are able to describe a simple diatomic chemistry for diffuse clouds, but fail to explain the surprisingly large abundances of more complex molecules seen in absorption studies (see for example Lucas & Liszt 2000) . Suggestions for explaining this picture have been proposed by e.g. Joulain et al. 1998, who have attempted to model the observations by introducing turbulence-driven energy input. Using the data of a recently completed line survey of the full 3 mm window with the IRAM 30m telescope towards the Galactic Centre source Sgr B2, we have studied absorption features of clouds along the line of sight towards the Sgr B2(M) continuum source to gather further information on the abundances of complex molecules in diffuse and translucent clouds.

A total of 42 transitions was modelled, belonging to 16 different molecular species and various of their respective isotopologues. It was possible to obtain abundances for 22 species in the clouds along the line of sight and lower limits for the abundances of 16 species (including isotopologues) in the envelope of Sgr B2(M). The data confirms the existence of a complex chemistry in the diffuse clouds. Through determining the abundances for different species and their isotopologues, it was possible to directly derive limits on the isotopic ratios in several regions throughout the Galaxy. In particular, we find a convincing trend towards raised abundances in the Galactic Centre region relative to the abundances of clouds along the line of sight that are located in the intervening spiral arms.

**Keywords.** astrochemistry, ISM: abundances, ISM: molecules

## References

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