

Search for PAH-like species with HIFI

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Thanks to the great data recently obtained by the Infrared Space Observatory, progress has been made on the characterization of the carriers of the "Unidentified" IR bands. Polycyclic aromatic hydrocarbons or closely related species seem to be the best candidates to account for these bands. Although no individual species could be identified, limits can now be put on their size distribution, in particular on the minimum size, which is an important tracer of the formation and of the processing of these species in the interstellar medium.

In this paper, we show how the HIFI instrument on board of FIRST can contribute significantly to this subject. PAHs are expected to emit in their low-frequency vibrational modes in the submillimeter range. Thanks to its very high resolution, HIFI has the unique capability to detect the rotational structure of these floppy modes, giving fundamental information on the size and shape of the emitters. Observations can be planned in regions submitted to UV photons where the UIR bands are well observed but also in more embedded objects. Besides the characterization of the emitting species and ultimately their identification, this work could have implications on the understanding of the physics and chemistry of the interstellar medium.