

HIGH RESOLUTION FAR INFRARED FOURIER TRANSFORM SPECTROSCOPY OF THE NH₂ RADICAL.

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First identified toward Sgr B2^a, the NH₂ radical has recently been detected in the interstellar medium by the HIFI instrument on board of Herschel^b. Despite the fact that this radical has not been detected in brown dwarfs and exoplanets yet, it is already included in physical and chemical models of those environments^c (temperature higher than 2000 K expected in several objects). Its detection in those objects will depend on the existence of a reliable high temperature and high resolution spectroscopic database on the NH₂ radical.

The absorption spectrum of NH₂ has been recorded between 15 and 700 cm⁻¹ at the highest resolution available using the Bruker IFS125HR Fourier transform interferometer connected to the far infrared AILES beamline at SOLEIL (R=0.001 cm⁻¹). The radical was produced by an electrical discharge (DC) through a continuous flow of NH₃ and He using the White-type discharge cell developed on the beamline (optical path: 24m).

Thanks to the brilliance of the synchrotron radiation, more than 700 pure rotational transitions of NH₂ have been identified with high N values (N_{max}=25) in its fundamental and first excited vibrational modes. By comparison to the previous FT spectroscopic study on that radical in the FIR spectral range^d, asymmetric splitting as well as fine and hyperfine structure have been resolved for several transitions.

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