

Future prospects for the high-resolution space far-infrared spectroscopy

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Abstract—The far-infrared spectral region enables studies of the key atomic and molecular cooling lines, revealing the nature of the cool, dense universe, hidden from view at shorter wavelengths. High-resolution spectroscopy provides the velocity information needed to understand fully the 3D motions of the gas and, in solar system objects, it allows the retrieval of the vertical abundance and temperature profiles, as well as measurements of the wind patterns. I summarize the approved and planned European spectroscopic missions for astrophysics, planetary, and Earth science, focusing on the unique aspects of the FIR.