

The $^{12}\text{CO}(1-0)$ to H_2 conversion factor in normal late-type galaxies: the contribution of FIRST

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The molecular gas mass in nearby galaxies is generally estimated using $^{12}\text{CO}(1-0)$ line intensities assuming the X conversion factor between $I(\text{CO})$ and $N(\text{H}_2)$ measured in the solar neighborhood. It is however known that this X conversion factor is not universal since it changes with metallicity, cosmic ray density and UV radiation field. Far-IR data in the spectral range 100-1000 μm can be used to estimate the molecular gas content of late-type galaxies in an independent way of CO line measurements once a constant dust to gas ratio is assumed, allowing a direct estimate of X . This exercise is here presented for a large sample of galaxies with available multifrequency data using ISOPHOT and IRAS far-IR data. This analysis, which is extremely useful to study the properties of the ISM of galaxies spanning a large range in luminosity and morphological type, is however limited by the lack of photometric data in the range $100 \mu\text{m} \leq \lambda \leq 1000 \mu\text{m}$, the spectral domain observed by FIRST.