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A Far Infrared Fine Structure Line Survey of a Nearby Blue Compact Galaxy

Far infrared fine structure lines have shown excellent potential as diagnostics of the interstellar medium. In addition to their demonstrated utility in measuring density, radiation field intensity, and star formation density, several combinations of lines have been proposed as metallicity diagnostics. The current state of these metallicity line diagnostics is uncertain as they are heavily model dependent. The acceptance of such a diagnostic, however, would open the early Universe to the first direct studies of metal enrichment and allow deeper investigations of surprising systems that have seemingly built up dust reserves a mere few hundred Myr after formation. We are attempting to provide a proof-of-concept for these line analyses by undertaking a fine structure line census of a nearby blue compact galaxy with well known characteristics.