UNRAVELING THE MYSTERIES OF COMPLEX INTERSTELLAR ORGANIC CHEMISTRY USING HERSCHEL/HIFI SPECTRAL LINE SURVEYS

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The goal of our ongoing Herschel Space Observatory OT1 program is to probe the influence of physical environment on molecular complexity through spectral line surveys. These observations target a sample of 10 sources, probe a range of physical environments, and include frequency windows that contain transitions from a set of known complex organic molecules. From these results, we have determined the fractional abundances of a set of organic molecules that are predicted by models to trace key chemical mechanisms in interstellar clouds. We are examining correlations between classes of molecules, as well as correlations between the physical properties of the source (i.e. temperature, density, age, etc.) and each molecular target. These results can be used as benchmarks to improve astrochemical models to the point where accurate predictions of complex molecular inventory can be based on the physical and chemical environment of a given source. Here we will report on preliminary results from these observations and discuss these results in the context of the effect that physical environment has on the chemical complexity of interstellar clouds.