

Seeing the trees through the forest: early results from the SOFIA/EXES mid-IR high spectral resolution library

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We proposed the creation of a high spectral resolution ($R \ge 50,000$) library of classical, MIR-bright sources covering ~ 5.23 to 28.3 micron with SOFIA/EXES. This proposal was awarded 100+ hours with 18.1 hours scheduled for 3 sources in May 2022. The observations were successfully carried out and the sources included: the archetypal Carbon star IRC +10216, and the hot cores NGC 7538 IRS 1 & AFGL 2136. The full suite of settings was observed for IRC +10216 with $R \sim 70,000$ and S/N (on the continuum) $\ge 1,000$. The coverage for the hot cores begins at 13.5 micron and for NGC 7538 IRS 1 continues all the way to 28.3 micron. Archival EXES observations are used to supplement the 5 to 8 micron region and all observations are at R = 50,000. Thousands of molecular transitions are contained within these spectra and we present some of our early findings. The data are publicly available in the SOFIA Science Archive at IRSA under Program ID 75 0106.