Submission 1:

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Title: ESCAPE Project “The JWST/MIRI view of HR 2562 b and κ And b”

Abstract:
The new generation of space telescopes is opening a window for the detailed characterization of exoplanets. In particular, JWST/MIRI provides a unique opportunity to study the young exoplanet population through thermal emission (MIR). Combined with ground-based NIR observations, this allows us to cover more than 90% of the bolometric flux of these objects. We present the first results from our GTO program focused on the characterization of two out of four planetary-mass companions: HR 2562 b and κ And b. Our main goal is to better constrain the effective temperature and radius, as well as other key physical parameters such as mass and age. Using MIRI coronagraphic observations in the F1065C, F1140C, and F1550C filters, we probed the atmospheric properties of both objects. HR 2562 b lies in the L/T transition, with a poorly constrained age and physical parameters (mass < 18 MJ, Teff = 1200-1700 K, log g = 4-5). κ And b, an L-type companion, has been the subject of a decade-long debate regarding its age (7-300 Myr) and atmospheric properties (e.g., Teff = 1650-2050 K, log g = 3.5-5.5). Our results significantly narrow down the atmospheric parameters of both companions, particularly Teff and radius, and provide more precise, model-dependent estimates of κ And b’s age and mass. In addition, our work includes improvements in data reduction that have already been integrated into community tools. These results demonstrate that JWST/MIRI is a transformative instrument for advancing our understanding of planetary atmospheres.