



5916 - TUNES: The Unintentional NIRISS Escape Survey

Cycle: 3, Proposal Category: AR

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OBSERVATIONS

ABSTRACT

JWST is currently -- and completely unintentionally -- conducting the largest survey of exoplanet atmospheric escape ever performed. NIRISS/SOSS is sensitive to the metastable helium 10380 Angstrom triplet (He^*), a powerful probe of atmospheric outflows. By the start of Cycle 3, 21 planets will have publicly-available NIRISS/SOSS transit and/or eclipse coverage on this feature, already the largest homogeneous escape survey ever conducted by a factor of two. We propose an archival program to realize the myriad scientific gains enabled by this new sample, including a uniform analysis of planetary mass-loss rates and searches for helium emission, tails, and chromospheric spot-crossing events. Our primary community-facing scientific product will be an online repository of all He^* lightcurves obtained with NIRISS/SOSS analyzed with multiple pipelines to ensure robustness. This program, which we call TUNES (The Unintentional NIRISS Escape Survey), will cement JWST's unanticipated legacy as an atmospheric escape machine without requiring any additional observing time.

OBSERVING DESCRIPTION