



Universiteit
Leiden
The Netherlands

The MUSCLES extension for atmospheric transmission spectroscopy

Behr, P.; France, K.; Youngblood, A.; Duvvuri, G.; Brown, A.; Bean, J.; ... ; Miguel, Y.

Citation

Behr, P., France, K., Youngblood, A., Duvvuri, G., Brown, A., Bean, J., ... Miguel, Y. (2023). The MUSCLES extension for atmospheric transmission spectroscopy. *Bulletin Of The American Astronomical Society*, 439.07. Retrieved from <https://hdl.handle.net/1887/3719110>

Version: Publisher's Version

License: [Creative Commons CC BY 4.0 license](https://creativecommons.org/licenses/by/4.0/)

Downloaded from: <https://hdl.handle.net/1887/3719110>

Note: To cite this publication please use the final published version (if applicable).

Bulletin of the AAS • Vol. 55, Issue 2 (AAS241 Abstracts)

The MUSCLES Extension for Atmospheric Transmission Spectroscopy

**Patrick Behr¹ Kevin France¹ Allison Youngblood² Girish Duvvuri¹
Alexander Brown³ Jacob Bean⁴ Cynthia Froning⁵
Zachory Berta-Thompson¹ J. Sebastian Pineda⁶ Yamila Miguel⁷**

¹University of Colorado, Boulder, ²NASA Goddard Space Flight Center,

³CASA, University of Colorado, ⁴University of Chicago, ⁵University of Texas, Austin, ⁶LASP,

⁷Leiden Observatory / SRON

Published on: Jan 31, 2023

URL: <https://baas.aas.org/pub/2023n2i439p07>

License: [Creative Commons Attribution 4.0 International License \(CC-BY 4.0\)](https://creativecommons.org/licenses/by/4.0/)

X-ray through infrared SEDs are essential for understanding a star's effect on exoplanet atmospheric composition and evolution. We present a catalog of panchromatic SEDs for 13 exoplanet hosting stars which have guaranteed JWST observation time as part of the ERS or GTO programs but have no previous UV characterization. The stars in this survey range from spectral type M-F ($0.14-1.57M_{\odot}$) and $\sim 4-132$ days in rotation period ($\sim 0.5-11.4$ Gyr in age). The SEDs are composite spectra using data from the Chandra X-ray Observatory and XMM-Newton, the Hubble Space Telescope, BT-Settl stellar atmosphere models, and scaled spectra of proxy stars of similar stellar type and activity. From our observations, we have measured a set of UV and X-ray fluxes as indicators of stellar activity level. We compare the chromospheric and coronal activity indicators of our exoplanet-hosting stars to a broader population of field stars and find that a majority of our targets have lower activity levels than the average population of cool stars in the solar neighborhood. This suggests that using SEDs of known exoplanet host stars as proxies for the average population of stars in the solar neighborhood may underestimate the true high-energy flux environment by an order of magnitude or more. In this talk we present the data and methods used in the assembly of the composite panchromatic SEDs for the MUSCLES Extension targets.