

Mega-MUSCLES Version 1.0 February 2022

The initial release of the Mega-MUSCLES SED are similar to the MUSCLES SEDs, and follow the same file name conventions. The readme for the MUSCLES SEDs applies in all cases except where detailed below. A full description of the production of the TRAPPIST-1 SED is presented in [Wilson et al. 2021](#), with the other Mega-MUSCLES SEDs following mostly the same techniques.

Major differences between MUSCLES and this release of Mega-MUSCLES are as follows:

- New DEM models: For a selection of stars (GJ699 and TRAPPIST-1 at time of release) the EUV scaling models covering the approximate range 120-1100 Å are replaced with a Differential Emission Measure model ([Duvvuri et al 2021](#)). DEMs for the remainder of the sample will be made available in future releases. DEM files are named as:
hlsp_muscles_model_dem_[STAR]_na_v[VERSION]_component-spec.fits
- Flux scalings: No adjustments have been made to the STIS flux calibration as: 1. The COS spectra were generally of too poor a signal to provide the same baseline measurements used in MUSCLES, and 2. The optical G430L STIS spectra were found to be in good agreement with photometry and other, reliably flux calibrated spectra.
- PHOENIX models: Mega-MUSCLES uses PHOENIX photospheric model spectra from the Lyon BT-Settl CIFIST 2011_2015 grid ([Allard 2016](#)), which extend out to 9995000.0 Angstroms. “const-res” SEDs, which are binned to 1 Angstrom resolution, only extend out to 130000 Angstroms to avoid the file size becoming very large.