

The Dependence of Cooling and Heating Functions on Local Radiation Fields

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Cooling and heating functions of gas determine its energy budget and the thermal pressure support it can provide. These functions are thus a key ingredient in the physics that control how stars and galaxies form. The radiative transfer physics shaping cooling and heating functions is known, but is too computationally expensive to include in hydrodynamic simulations for realistic local radiation fields within galactic halos. Instead, a fast approximation scheme is needed.

We use machine learning to investigate which wavelength bands of the radiation field most strongly affect cooling and heating functions. We use these results to develop more accurate approximation schemes to cooling and heating functions in the presence of a local radiation field.

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