

Radiation-coupled Chemistry in Cosmological Simulations of Galaxy Formation

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In cosmological, radiation-hydrodynamics simulations of galaxy formation, chemical abundances and ionisation fractions are often determined by post-processing, which fails to capture the effect the chemical state has on the radiation field (by absorption and emission processes) and ultimately on the dynamics of the gas (by radiative cooling, and indirectly by other interactions with radiation). We have modified the RAMSES-RT radiation-hydrodynamics code to include a rich chemical network, coupled to the radiative transfer solver, so that the chemical state can be calculated self-consistently, rather than via post-processing.

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