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# The photon budget of galaxies during the epoch of reionisation in the Cosmic Dawn II simulation

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## Abstract

The Cosmic Dawn II simulation is a massive simulation of galaxy formation during the epoch of reionization. It describes the evolution of a 91 Mpc-side box discretized on a fixed 40963 grid, using 65536 MPI domains running on 16384 nodes and 16384 GPUs, allowing to resolve 108 M haloes, down to  $z=5.8$ . It was run with RAMSES- CUDATON, a hybrid CPU-GPU for fully coupled radiation-hydrodynamics simulations described in Ocvirk et al. (2016). Cosmic Dawn II improves on its predecessor Cosmic Dawn I thanks to a better calibration. This results in a much better agreement with most observables of the epoch of reionization: the reionization history of the Universe as inferred from the Lyman-alpha forest, the cosmic star formation rate density, the mean ionizing flux density, the mean electron scattering optical depth seen by the Cosmic Microwave Background, and the UV luminosity function of galaxies down to  $M_{1600} = -13$  and over a broad range of 10 magnitudes.

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