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DarkHistory NN: Computing early universe exotic energy injection imprints with Neural Network

Thursday, 7 July 2022 12:00 (15 minutes)

In this talk, I will present a Neural Network-improved version of DarkHistory, a code package that self-consistently computes the early universe temperature, ionization levels, and photon spectral distortion due to exotic energy injections. We use simple multilayer perceptron networks to store and interpolate complicated photon and electron transfer functions, previously stored as large tables. This improvement allows DarkHistory to run on small computers without heavy memory and storage usage while preserving the physical predictions to high accuracy. It also enables us to explore adding more parametric dependence in the future to include additional physical processes and spatial resolution.

In-person participation

Yes

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