

# Hidden in the background: BBN photodisintegration limits on relics decaying into neutrinos.

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Constraints on dark sector particles decaying into neutrinos typically focus on their impact on the effective number of relativistic species,  $N_{eff}$ , in the early Universe. However, for heavy relics with longer lifetimes, constraints mainly arise from the photo-disintegration of primordial abundances. The high-energy neutrinos injected by the decay can interact with both the thermal neutrinos and other high-energy neutrinos. Among these interactions, annihilations into electromagnetic particles will induce an electromagnetic cascade that affects the abundances of the already formed light elements via photo-disintegration. In this work, we present constraints on these dark sector particles. Specifically, we implement a Monte Carlo code to simulate the electromagnetic cascade, instead of solving the full set of Boltzmann equations. We find improved bounds on the particle's lifetime, abundance, and mass.

## Title of the Poster/Talk

BBN constraints on neutrino injection into the early Universe

## Related Papers/Preprints

**Primary authors:** FRERICK, Jonas (DESY-T); Dr SCHMIDT-HOBERG, Kai (Deutsches Elektronen-Synchrotron DESY); Dr HUFNAGEL, Marco (Service de Physique Théorique, Université Libre de Bruxelles); DEPTA, Paul Frederik (Max-Planck-Institut für Kernphysik); BIANCO, Sara (DESY Hamburg); Dr HAMBYE, Thomas (Service de Physique Théorique, Université Libre de Bruxelles)

**Presenter:** BIANCO, Sara (DESY Hamburg)

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