

SN1987A constraints on Hadronically Interacting Sub-GeV Dark Matter

We clarify the plasma effects on the couplings of dark photon and $U(1)_{B-L}$ gauge boson in medium and calculate the production rate of these two models in SN1987A via nucleon bremsstrahlung in detail, along with some secondary production channels. From the stellar cooling argument, we obtain the constraints on dark photon and $U(1)_{B-L}$ gauge boson. A new excluded region arises from the longitudinal component of $U(1)_{B-L}$ gauge boson, and we update the excluded region for dark photon.

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