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Supernova constraints on the interactions of dark matter

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Assuming the dark matter (DM) particle has hadronic interactions, we estimate the SN1987A limits on the effective hadronic DM couplings in the framework of dim-5 and dim-6 operators. The cross sections for the effective DM-nucleon couplings can be excluded up to $\sim 10^{-52}\,\mathrm{cm}^2$ for DM mass down to the MeV scale, depending largely on the interaction type. We also update the supernova constraints on the absorptive DM operators.

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