

The impact of EDGES 21-cm data on WIMP dark matter interactions

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The recently announced results on the 21-cm absorption spectrum by the EDGES experiment can place very stringent limits on dark matter annihilation cross sections. We properly take into account the heating energy released from dark matter annihilation from the radiation epoch to the 21-cm observation redshifts in the radiative transfer to compute the evolution of the gas temperature. Our results show that the global 21-cm absorption profile is a powerful cosmological probe of the dark matter interactions. For dark matter annihilating into electron-positron pairs, the EDGES results give a more stringent upper limit than the PLANCK result on the annihilation cross section at the lower dark matter mass region.

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