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Constraints on dark matter powered stars from the extragalactic background light

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Recently, it has been proposed that self-annihilating dark matter could have a significant effect on the formation and development of the first stars in the universe. In such a model, the energy from self-annihilation of dark matter particles may be the main power source for this class of young stellar objects called Dark Stars (DS). Their features (e.g. luminosity, temperature, lifetime) differ from normal POP III stars and therefore makes them distinguishable. The contribution of DS to the extragalactic background light considering multiple initial parameters is calculated. By comparing our results with existing data of the EBL we can derive first observational limits on Dark Stars in the early universe. Future observations will improve these constraints.

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