

Observability of low mass Pop III survivors in the Milky Way and dwarf galaxies

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We study the number and the distribution of low mass Pop III stars in the Milky Way. In our model, hierarchical formation of dark matter minihalos and Milky Way sized halos are followed by high resolution cosmological simulations. We model the Pop III formation in H₂ cooling minihalos without metal under UV radiation of the Lyman-Werner bands. Assuming a Kroupa IMF from 0.15 to 1.0 Msun for low mass Pop III stars, as a working hypothesis, we constrain the theoretical models in reverse by current and future observations.

We find that the survivors tend to concentrate on the center of halo and subhalos. We also evaluate the observability of survivors in the Milky Way and dwarf galaxies, and constraints on the number of Pop III per minihalo. The higher latitude fields require lower sample sizes because of the high number density of stars in the galactic disk, and the required number of dwarf galaxies to find one survivor is less than ten at 100 kpc for the tip of redgiant stars. Provided that available observations have not detected any survivors, the formation models of low mass Pop III stars with more than ten per minihalos are already excluded.

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Talk/Poster

Talk

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