

The initial mass function of the first stars inferred from elemental abundances in extremely metal-poor stars

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We develop the code to fit observed elemental abundance patterns with the supernova yield models of the first (metal-free) stars. The yield models of first-star's masses in the range 13-100 M_{sun} with several different explosion energies are calculated based on the mixing-fallback model to approximately take into account the mixing and fallback of elements in aspherical explosions. We use this code to fit elemental abundance patterns of more than 200 extremely metal-poor ($[\text{Fe}/\text{H}] < -3$) stars compiled from literature. The results suggest that the mass function of the first stars that have contributed to the first chemical enrichment is peaked at $\sim 25M_{\text{sun}}$ with smaller contributions from lower-mass first stars. I will discuss their implications, limitations and the application to an expanded sample of extremely metal-poor stars.

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Talk/Poster

Talk

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