

U13a Impact of Gravitational Lensing on Searches for Population III Pair-Instability Supernovae

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Superluminous supernovae have been proposed to arise from Population III progenitors that explode as pair-instability supernovae. Future near-infrared surveys with ULTIMATE-Subaru and WFIRST will be able to observe such PISNe at high redshifts ($z > 5$). We perform a mock transient survey to search for these rare objects to assess their detectability and how gravitational lensing by line-of-sight structure can aid in their detection. We find that a survey that targets massive galaxy clusters to take advantage of their lensing magnification properties can increase the number of detected sources beyond $z \sim 6$ by a factor of ~ 2 . At higher redshifts ($z > 7$), a blank field survey to 26.5 mag will not find any PISNe, and lensing magnification will be needed to unveil these objects.