X55a Early Low-Mass Galaxies and Star-Cluster Candidates at $z \sim 6 - 9$

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We present very faint dropout galaxies at $z \sim 6 - 9$ with a stellar mass $M_\star$ down to $M_\star \sim 10^6$ M$_\odot$ that are found in the Hubble Frontier Fields (HFF) program in conjunction with the deep *Spitzer* images and lensing effects. We investigate stellar populations of the galaxies with the optical/NIR photometry and BEAGLE (stellar population synthesis + photoionization) models, identifying 357 galaxies with $M_\star \sim 10^6 - 10^9$ M$_\odot$. We derive the galaxy stellar mass functions (GSMFs) at $z \sim 6 - 9$ that extend a stellar mass limit to $M_\star \sim 10^6$ M$_\odot$. Comparing $M_\star$ of the galaxies with the effective radii R_e on the source plane, we have pinpointed two objects with low stellar masses ($M_\star \leq 10^7$ M$_\odot$) and very compact morphologies ($R_e \leq 40$ pc) that are comparable with those of globular clusters (GCs) in the Milky Way today. These objects are candidates of star clusters that should be a part or a dominant component of high-redshift low-mass galaxies, some of which may be related to GCs today.