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The Origin of Young Stellar Populations in NGC 1783: Accretion of External Stars

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The presence of young stellar populations in Large Magellanic Cloud cluster NGC 1783 has caught significant attention, with suggestions ranging from it being a genuine secondary stellar generation to a population of blue straggler stars or simply contamination from background stars. Thanks to multi-epoch observations with the *Hubble Space Telescope*, proper motions for stars within the field of NGC 1783 have been derived, thus allowing accurate cluster membership determination. Here, we report that the younger stars within NGC 1783 indeed belong to the cluster, and their spatial distribution is more extended compared to the bulk of the older stellar population, consistent with previous studies. Through N -body simulations, we demonstrate that the observed characteristics of the younger stars cannot be explained solely by blue straggler stars in the context of the isolated dynamical evolution of NGC 1783. Instead, accretion of the external, low-mass stellar system can better account for both the inverse spatial concentration and the radial velocity isotropy of the younger stars. We propose that NGC 1783 may have accreted external stars from low-mass stellar systems, resulting in a mixture of external younger stars and blue straggler stars from the older bulk population, thereby accounting for the characteristics of the younger sequence.

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