

A SYNOPTIC VIEW OF THE MAGELLANIC CLOUDS:  
VMC, GAIA AND BEYOND

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**The Main Sequence Kink at  $T \sim 7800$   
K and its Impact on the Nature of  
Extended Main Sequence Turnoffs**

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Extended main sequence turn-offs (eMSTOs) are very common in color-magnitude diagrams (CMDs) of Magellanic Cloud star clusters. Their nature is still debated. The most popular scenarios are extended star formation and ranges of stellar rotation rates. We propose to present implications of a kink feature in the main sequence (MS) of young star clusters in the LMC. It shows up prominently in new HST observations of the 700-Myr-old cluster NGC 1831, and is located below the region in the CMD where multiple or wide MSes, which are known to occur in young clusters and thought to be due to varying rotation rates, merge together into a single MS. The kink occurs at a stellar mass of  $1.45 \pm 0.02$  Msun; we posit that it represents a lower limit to the mass below which the effects of rotation on the energy output of stars are rendered negligible at the LMC metallicity. Interestingly, in CMDs of massive eMSTO clusters in the LMC with ages of  $\sim 1.7$  Gyr, these stars are located in a region where the eMSTO is already significantly wider than the MS below it. This implies that stellar rotation cannot fully explain the wide eMSTOs in massive intermediate-age clusters in the Magellanic Clouds.