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

ESO-HQ, GARCHING BEI MÜNCHEN, GERMANY
September 9-13, 2019

Combined Effects of Rotation and Age Spread on Extended Main Sequence Turn Offs

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The extended main sequence turn off (eMSTO) has become recognized as a common, yet puzzling feature of stellar populations since its discovery in the Magellanic Clouds a decade ago with the Hubble Space Telescope (HST). The eMSTO revealed that star clusters are much more complex than we had thought, and since then the origin(s) of the eMSTO have been hotly debated. With new synthetic stellar populations computed from the MESA stellar evolution code, we explore two of the leading theories of the eMSTO phenomenon: an extended star formation history and a range of stellar rotation rates. I will discuss our exploration of the combined effects of both scenarios, including for the first time a non-parametric model for the rotation rate distribution. We find that slow rotators comprise bluer colors, and fast rotators redder colors in the MSTO, as recently observed. Major aspects of the cluster morphology can be replicated with a distribution of rotation rates alone, although we cannot currently rule out a duration of extended star formation from analysis of the MSTO by itself. Future Vsini measurements for eMSTO stars in the MCs will yield novel constraints on rotating stellar models.