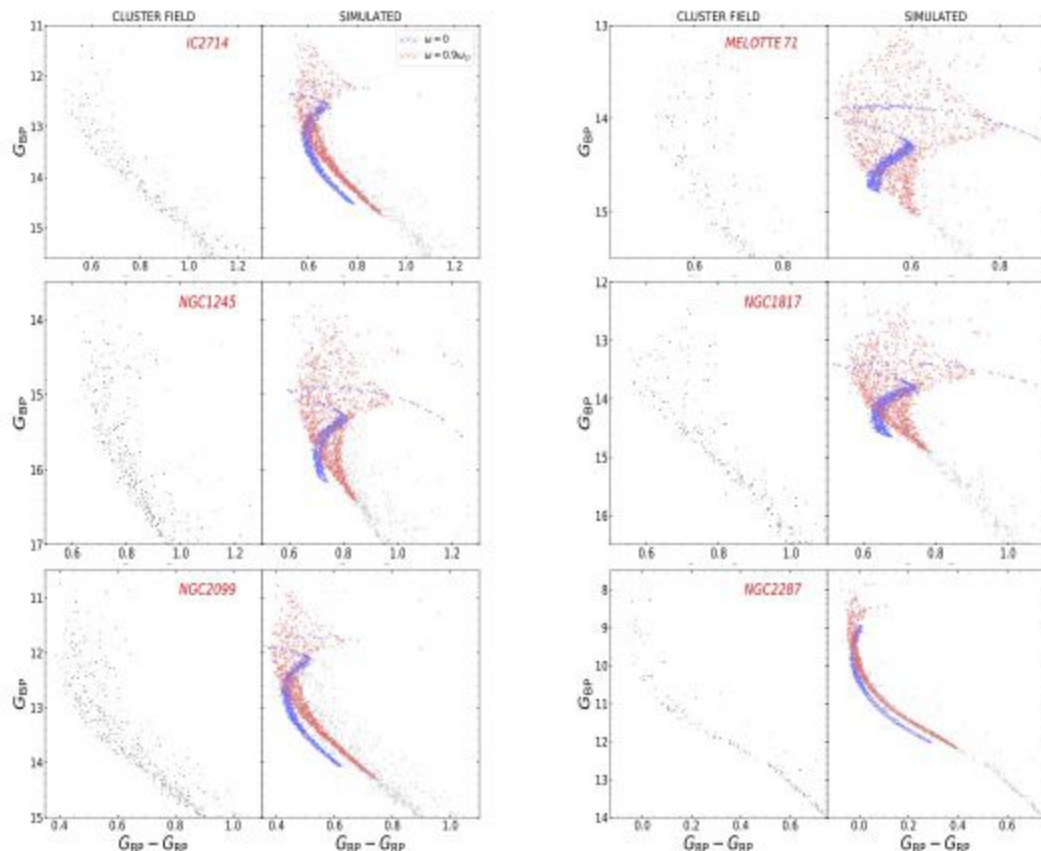




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<b>Title</b>	Extended Main-sequence Turnoff as a Common Feature of Milky Way Open Clusters
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**Figure 12.** Left panels: reproduction of the observed CMDs of cluster members of IC 2714, Melotte 71, NGC 1245, NGC 1817, NGC 2099 and NGC 2287. Right panels: comparison of the observed CMDs plotted in the left panels (gray dots) and simulated CMDs of a non-rotating stellar population (blue) and of a stellar population with rotation  $\omega = 0.9\omega_{\odot}$  (red).

(2017). The procedure that was exploited to derive accurate age distributions is illustrated in Figure 10 for NGC 2099 and is similar to what we have used in previous work (e.g., Milone et al. 2015).

In a nutshell, we first derived by hand the parallelepiped plotted in Figure 10 with the criterion of selecting the region around the turn off where the color and magnitude spread due to age variation are clearly distinguishable. Only stars within the parallelepiped are used to infer the age distribution. Then, we overimposed on the CMD a grid of isochrones with the same metallicity and  $[\alpha/\text{Fe}]$  and ages between 380 and 700 Myr in steps of 10 Myr (gray lines in Figure 10) and derived isochrones separated by 1 Myr by linearly interpolating among these isochrones. We associated the age of the closest isochrone to each star and derived the age distribution shown in the right panel of Figure 10. Finally, we calculated the median age and the absolute value of the difference between the age of each star and the median. We considered the 68.27th percentile of the distribution of these absolute values as indicative of the observed age spread,  $\sigma_{\text{AGE,obs}}$ . To estimate the

contribution of observational errors on the inferred age spread, we applied the procedure described above to the simulated CMD of a simple population and derived the corresponding age spread,  $\sigma_{\text{AGE,sim}}$ . The intrinsic age spread is estimated as  $\sigma_{\text{AGE}} = \sqrt{\sigma_{\text{AGE,obs}}^2 - \sigma_{\text{AGE,sim}}^2}$ . Uncertainties on  $\sigma_{\text{AGE}}$  are derived by bootstrapping with replacements performed 1000 times on both the observed and the simulated age distributions.

Our results are summarized in Table 1 where we provide the full width half maximum of the age distribution,  $\text{FWHM} = 2.355 \cdot \sigma_{\text{AGE}}$ , for each cluster. We find that the FWHM ranges from  $\sim 70$  for NGC 3114 to  $\sim 260$  Myr for NGC 5822 and correlates with the cluster age as shown in Figure 11, with old clusters having, on average, larger age spread than younger clusters. A similar trend between the age spread inferred from the eMSTO and the cluster age is also present among MC clusters and is interpreted as the signature of stellar rotation. Indeed, since rotating stars have longer MS lifetime than non-rotating stars with the same age and mass,