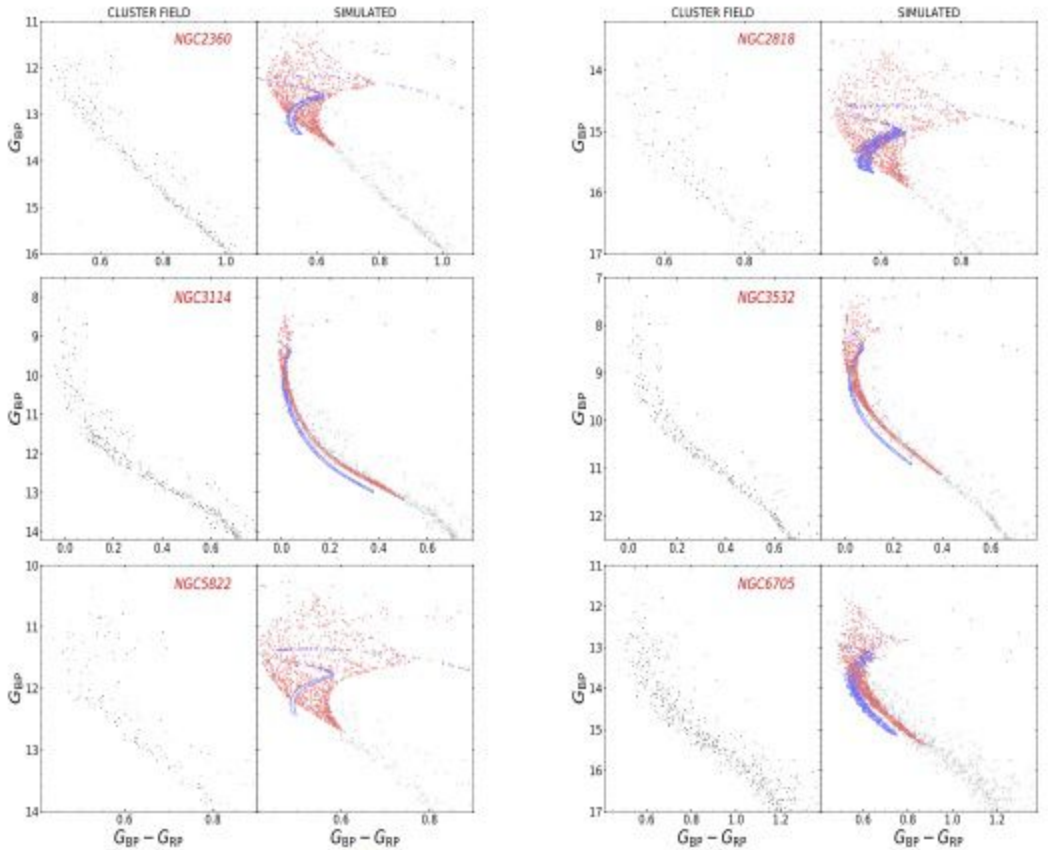

Figure 13. The same as in Figure 12 but for NGC 2360, NGC 2818, NGC 3114, NGC 3532, NGC 5822, and NGC 6705.

they would appear younger than coeval non-rotating stars within the same cluster. In this case, if the resulting eMSTO is interpreted as an age spread, the resulting age spread would correlate with the cluster age (Niederhofer et al. 2015; Bastian et al. 2018). On the other hand, in the case of a true age spread, we would expect that the amount of age spread does not depend on cluster age, and therefore a correlation would be very unlikely.

To further investigate the effect of rotation on the observed CMDs, we extended the method by Niederhofer and collaborators to Galactic open clusters and compared the observations with simulated CMDs of coeval stellar populations with different rotation rates based on stellar models from the Geneva database with $Z = 0.014$ and various ages (Mowlavi et al. 2012; Ekström et al. 2012; Georgy et al. 2014). To simulate the CMDs, we first retrieved the synthetic photometry corresponding to the best-fit non-rotating isochrones, and for the isochrones with rotation equal to 0.9 times the breakout value ($\omega = 0.9\omega_{cr}$). These data account for the limb-darkening effect as in Claret (2000), adopt the gravity-darkening model by Espinosa Lara & Rieutord (2011), and assume random distribution for the viewing angle. We transformed the synthetic photometry into the observational plane by adopting the model atmospheres by Castelli & Kurucz (2000) and the transmission curves of the G_{BP} and G_{RP} filters of *Gaia*. We assumed that one third of stars in the simulated CMD do not rotate, while two-thirds of stars have $\omega = 0.9\omega_{cr}$, in close analogy with what is observed in MCs open clusters (e.g., Milone et al. 2018).

We first applied the procedure above to each synthetic CMD, by assuming that the eMSTO is due to age spread, and derived the FWHM of the age distribution. Results are represented with gray dots in Figure 11. As expected, the age spread increases with the cluster age, in close analogy with what was previously found by Niederhofer et al. (2015) in MCs clusters. The fact that the FWHM values derived for synthetic CMDs and for Galactic open clusters follow similar trends against the cluster age suggests that rotation is mainly responsible for the observed eMSTOs.

Finally, in Figures 12–13, we compare the CMDs of cluster members (left panels) with simulated CMDs (right panels). Synthetic CMDs are derived from the Geneva database