

Chemical Evolution Model of Dwarf Spheroidal Galaxies Complying with Observed Star Formation Histories

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We construct a new chemical evolution model for dwarf spheroidal galaxies (dSphs) **aiming to reproduce both the observed star formation histories (SFHs) and metallicity distribution functions (MDFs) simultaneously**. By using the SFHs estimated from observed color magnitude diagrams, we calculate the chemical evolution of four dSphs, i.e., Fornax, Sculptor, Leo II, and Sextans. It is found that our new model nicely reproduces the chemical properties of the dSphs except Sextans, and our new model favors longer onset time of Type-Ia supernovae (SNe Ia) (i.e., 0.5 Gyr) than that suggested in previous studies (i.e., 0.1 Gyr).

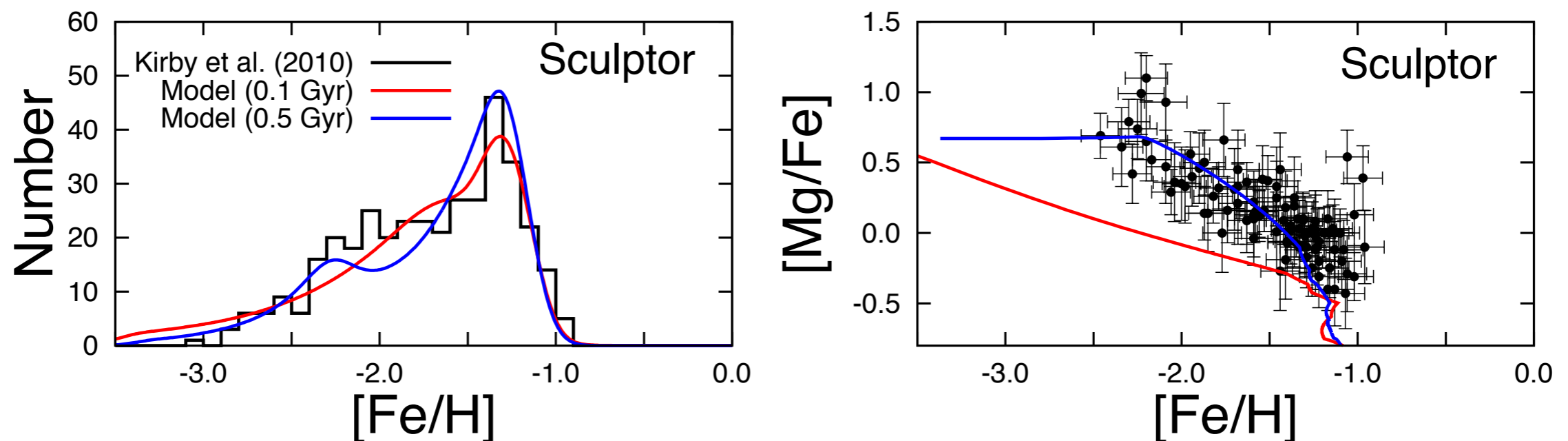


Fig. The MDF and $[\text{Mg}/\text{Fe}]$ vs. $[\text{Fe}/\text{H}]$ diagram of Sculptor dSph. The histogram and dots with error bars are data observed by Kirby et al. (2010). The red and blue lines are our model results by adopting the different onset time of SNe Ia, i.e., 0.1 Gyr and 0.5 Gyr, respectively.