

# Understanding the formation and evolution of the Galactic disc(s) using Mono-Age Population Phase-space Distributions (MAPPED) analysis

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Large scale Galactic surveys have enabled us to study the Galactic disc(s) in exquisite detail, using multi-dimensional age-metallicity-phase space (i.e.  $t$ ,  $[M/H]$ ,  $v$ ,  $x$ ) information of a large sample of stars. This enormous wealth of information provides important clues to understanding the formation and evolution of the Galactic disc(s). Here, I will present the study on the Galactic disc(s) using the LAMOST spectroscopic survey of the Galactic Anti-center (LSS-GAC). Specifically, we have selected two main-sequence turn-off stars (MSTOs) samples from the LAMOST-TGAS ( $\sim 0.1$  million stars) and LAMOST ( $\sim 1$  million stars), respectively. Both samples have relatively accurate age determinations of stars (20-30% errors). The two samples allow us to study the Galactic disc(s) in multi-dimensional age-metallicity-phase space (e.g.  $V_{\text{phi}}-[Fe/H]$  relation as a function of age and age-velocity dispersion relation for different disc regions), yielding pivotal information that help constrain the formation and evolution of the Galactic disc(s).