

Young alpha-rich stars as stragglers of the thick disc

Young alpha-rich (YAR) stars have been detected in the past as outliers to the local age-[alpha/Fe] relation. These objects are enhanced in alpha-elements but apparently younger than typical thick disc stars.

Taking advantage of the Gaia DR3 and APOGEE DR17 data, we investigate the global kinematics and chemical properties of YAR giant stars in this last survey and show that they have properties similar to those of the standard thick disc stellar population. The position of these stars in the Gaia color magnitude diagram shows that they are more massive than standard thick disc objects. This leads us to conclude that YAR are rejuvenated thick disc objects, most likely evolved blue stragglers.

We compare the elemental abundances of our sample with those of standard thick disc stars, and we find that our YAR stars are shifted in oxygen, magnesium, sodium, and the slow neutron-capture element cerium. Although we detect no sign of binarity, the enhancement in cerium may be the signature of a mass transfer from an asymptotic giant branch companion. The most massive YAR stars suggest that mass transfer from an evolved star may not be the only formation pathway, and that other scenarios, such as collision or coalescence should be considered.