

Abstract

It is now well established that globular clusters (GCs) exhibit star-to-star light-element abundance variations (known as multiple stellar populations, MPs). Such chemical anomalies have been found in (nearly) all the ancient GCs (more than 10 Gyr old) of our Galaxy and its close companions, but so far no model for the origin of MPs is able to reproduce all the relevant observations. To gain new insights into this phenomenon, we have undertaken a photometric Hubble Space Telescope survey to study clusters with masses comparable to that of old GCs, where MPs have been identified, but with significantly younger ages. Nine clusters in the Magellanic Clouds with ages between ~ 1.5 -11 Gyr have been targeted in this survey. We confirm the presence of multiple populations in all clusters older than 2 Gyr (5 out of 9) but do not find evidence for MPs in any cluster with ages less than 2 Gyr (4 out of 9). This surprisingly points towards an unexpected age dependence for the onset of multiple populations, which is not predicted by any model that has been proposed so far to explain the formation and evolution of the chemical anomalies.