Massive parallel spectroscopy: A stellar census of galactic globular clusters

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Abstract

Our knowledge of Galactic globular clusters (GCs) has progressed significantly in the previous years. The availability of adequate data has given us unique insights into their chemical composition as well as their dynamics. A true paradigm shift has been the discovery that GCs consist of multiple stellar populations. The discovery has triggered an ongoing discussion about the formation of GCs as none of the models invoked so far to explain the existence of multiple populations can explain the wealth of existing data. Further insight may come from studies of the cluster dynamics, i.e. the rotation properties (Kamann et al. 2018) as well as binary fraction as well as possible intermediate mass or stellar black holes (Giesers et al. 2018). Our ongoing observations with MUSE at the VLT using its unique capabilities allowed us to acquire more than 1 000 000 spectra for more than 200 000 stars in 25 GCs. We make use of our source extraction code designed to extract spectra from 3D data cubes in crowded stellar fields. We then use our extensive grid of model atmospheres for a full spectrum analysis. We use these data to investigate the spectroscopic and kinematic properties of GCs and their multiple populations. A status report of the project is presented at the conference.

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