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VIMOS@VLT photometric and spectroscopic survey of the Sagittarius dwarf spheroidal galaxy

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Abstract. The closest neighbour of the Milky Way (MW), the Sagittarius dwarf Spheroidal Galaxy (Sgr dSph) is being tidally destroyed by the interaction with our Galaxy, losing its stellar content along a huge stream clearly detectable within the Galactic Halo. The stellar content and internal dynamics of Sgr dSph are poorly known due to its dimensions (about 20x5 $degree^2$ in the sky) . We thus undertook a photometric and spectroscopic survey of Sgr dSph with VIMOS@VLT, to derive colour - magnitude diagrams (CMD) and radial velocities across the extension of the galaxy. We observed 8 fields along the major and minor axis of the galaxy (along 7 degrees and 2 degrees respectively), plus 6 globular cluster likely associated with the galaxy (NGC 4147, Pal5, Pal12, Arp2, Ter7, Ter8). All of them were observed with V and I filters. The photometric catalogue was then used to select target for VIMOS-MOS high resolution mode. We obtained spectra for about 1200 stars. 250 stars in the Sgr main body fields were established as Sgr dSph members, and will now be the subject of high resolution spectroscopy studies for the purpose of chemical analysis. This constitutes one of the richest photometric and spectroscopic homogeneous catalog of Sgr dSph stars ever realized. The survey led to discover a surprising variety in the CMDs at varying distances from the dSph center, with younger, more metal rich populations in the dSph nucleus, preliminary evidence for a metallicity gradient and some hint of dishomogeneity along the major axis.

Key words. Stars: abundances – Stars: Populations – Cosmology: Dwarf galax – Galaxy: globular clusters

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