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Probing the low surface brightness outskirts of Milky Way dSphs: Sextans

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Abstract. Faint dwarf galaxies such as those found around the Milky Way (MW) display the largest known dynamical mass-to-light ratios (up to several 100s $M_\odot/L_\odot$). However, tidal interaction with the MW may impact the dynamical equilibrium in the outer parts of some of these objects, and partly affect the derived dynamical M/L. Assessing this is crucial for the study of the dark matter content of these galaxies. A clear sign of ongoing tidal disturbance would be the presence of tidal tails. These are expected to be low surface brightness features, hence difficult to detect from star counts in systems where contamination is also present, e.g. from foreground MW stars. At present we have searched for these sorts of tidal features in the Sextans dwarf spheroidal galaxy (dSph), by adopting the Matched Filter Method (e.g. Rockosi *et al.* 2002), a very efficient technique to decontaminate stellar density maps with a high ratio of contamination versus source density (dwarf galaxies outer regions or ultra faint dwarf galaxies). We also calculate structural parameters from the position of stars without requiring spatial binning (Richardson *et al.* 2011), through a Bayesian MCMC (Foreman-Mackey *et al.* 2013).

Keywords. galaxies: individual (Sextans), galaxies: dwarf, Local Group, dark matter, galaxies: photometry, Hertzsprung-Russell diagram

1. Conclusions

Our preliminary analysis of the structural properties of the Sextans dSph from very wide area and deep CTIO/DECam g- and r-band photometry (PI: B. McMonigal) shows a regular 2D surface density distribution, with no evident signs of tidal disturbance. The most likely value for the nominal King tidal radius is less than the half of the one inferred by photographic plates (Irwin & Hatzidimitriou 1995), making the physical extent of Sextans much more comparable to the other classical MW dSphs. Some of the next steps in our analysis will be to quantify the amount of tidal debris that might have escaped detection and to determine the spatial distribution of stars in different evolutionary phases. We will then apply a similar analysis to the best available wide-area photometric data-sets of other MW classical dSphs.

References

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