

Deep imaging of low surface brightness structures near galaxies

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Using two identical modest-sized telescopes with an aperture of 0.7m and a field of view of approximately 1 sq. degree, we obtained deep observations (down to 28-30 mag/arcsec² in the R band) for about 250 sq. degrees of the celestial sphere with a primary goal of detecting extended low surface brightness (LSB) features around nearby galaxies of different morphology, inclination, and environment. These LSB features, such as extended galaxy stellar halos (the HERON project), stellar streams and tails, heated disc material, and possibly complex non-spherical shapes of galaxy bulges, can be produced by minor merger events which are important drivers of the galaxy formation and evolution within the Λ CDM cosmological paradigm. Another goal of this work is searching for candidates to LSB and ultra diffuse galaxies in the obtained frames. We describe the methodology for detecting such galaxies and analyse the properties of the selected objects. Finally, we analyse the outer stellar component (thick disc or halo) and describe its shape (discy, boxy or roundy). We propose that for the target galaxies the environment (minor merging) and their structural composition (e.g. the relations between structural parameters of the thin and thick discs) define the shape of the outer galaxy isophotes.