These results could be associated to the morphological evolution of galaxies, as proposed by different authors (Poggianti et al. 2009, Dressler et al. 2009) for rich clusters.

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THE RELATION BETWEEN THE SPECTRAL SYNTHESIS OF GALAXIES IN THE VISIBLE REGION AND THEIR UV EMISSION

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The STARLIGHT Project has analyzed almost a million spectra extracted from the Sloan Digital Sky Survey (SDSS) by using the empirical spectral synthesis approach described by Cid Fernandes et al.(2005). Spectral synthesis consists on the optical spectrum fitting by using simple stellar population libraries, such as Bruzual & Charlot (2003). It also considers the reddening caused by dust and the velocity dispersion due to the motion of the stars within the galaxy. Since the model that best fits the optical region can also be extended to the ultraviolet, we compare our predictions to the UV photometry of the same galaxies measured by the GALEX satellite, studying the systematics and nature of the differences. In this current presentation, we show the upcoming challenges in order to accomplish this investigation. The main motivation of this study is to obtain realistic spectral models from the UV to the optical regions for the study of high redshift galaxies.

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RESOLVING GALAXIES IN TIME AND SPACE: APPLYING STARLIGHT TO CALIFA DATA CUBES

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Fossil record methods based on spectral synthesis techniques have matured over the past decade, and their application to integrated galaxy spectra fostered substantial advances on the understanding of galaxies and their evolution. Yet, because of the lack of spatial resolution, these studies are limited to a global view, providing no information about the internal physics of galaxies. Motivated by the CALIFA survey, which is gathering Integral Field Spectroscopy over the full optical extent of 600 galaxies, we have developed an end-to-end pipeline which: (i) partitions the observed data cube into Voronoi zones in order to, when necessary and taking due account of correlated errors, increase the S/N, (ii) extracts spectra, including propagated errors and bad-pixel flags, (iii) feeds the spectra into the STARLIGHT spectral synthesis code, (iv) packs the results for all galaxy zones into a single file, (v) performs a series of post-processing operations, including zone-to-pixel image reconstruction and unpacking the spectral and stellar population properties into multi-dimensional time, metallicity, and spatial coordinates. This work provides a description of this whole pipeline and its data products. These include 3D cubes of the stellar formation history, 2D maps of galaxy properties such as the v-field, stellar extinction, mean ages and metallicities, mass surface densities, star formation rates on different time scales and normalized in different ways, 1D averages in the temporal and spatial dimensions, projections of the stellar light and mass growth (x,y,t) cubes onto radius-age diagrams, etc. The results illustrate the richness of the combination of IFS data with spectral synthesis, providing a glimpse of what is to come from CALIFA and future IFS surveys.

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OPEN CLUSTER RADIAL VELOCITY DETERMINATION FROM OBSERVATIONS AT OBSERVATÓRIO PICO DOS DIAS

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In studies of the dynamics of the Galactic disk, such as the determination of the speed of the spiral pattern and the permanence of stars in the spiral arms, it is crucial to know orbits obtained from proper

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motions, radial velocities and the potential of the Galaxy. Aiming to improve the statistics of our catalog of open clusters, maintained by our research group, we determined the radial velocity of stars belonging to a group of open clusters using spectra with a resolution of 4000, obtained at the Pico dos Dias Observatory (LNA) with the 1.60 m telescope and the Coudé spectrograph.

We observed the open cluster's member stars and calculated their radial speeds using standard techniques. The stars were selected from our own database based on relevant information concerning the clusters, obtained by statistical analysis of their proper motions and/or their position in the HR's diagram. In this work, we present the detailed analysis of the data reduction and radial velocity determination using synthetic spectra from different libraries. Finally we present the open cluster's radial (and spacial) velocities.

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THE FORMATION OF DSPH GALAXIES

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Dwarf spheroidal (dSph) galaxies are considered the basic building blocks of the galaxy formation process in the ΛCDM (Lambda Cold Dark Matter) hierarchical cosmological model. These galaxies are believed to be the most dark matter (DM) dominated systems known, have the lowest stellar content, and are poor in gas. Many theories attempt to explain the formation of dSph galaxies resorting to the fact that these galaxies are mainly found orbiting large galaxies or invoking other mechanisms of interactions. Here we show the full set of simulation as an extension of our fiducial model, where we study the formation of classical dSph galaxies in isolation by dissolving star clusters within the DM halo of the dwarf galaxy. In our parameter survey we adopt cored and cusped DM halo profiles and consider different numbers of dissolving star clusters. We investigate the dependency of observable quantities with different masses and scale-lengths of the DM halo and different star formation efficiencies (SFE). We find that our proposed scenario explains many features of the classical dSph galaxies of the Milky Way, like their morphology and their dynamics. We see trends how the surface brightness and the scale-length of the luminous component vary with the parameters of our simulations. We also identify how irregularities in their shape, i.e. clumpiness and ellipticity vary in our simulations. In velocity space, we identify the parameters leading to flat velocity dispersions curves. We recognize kinematically cold substructures in velocity space, named fossil remnants and stemming from our unique initial conditions, which alter the expected results. These streaming motions are considered as a key feature for future observation with high resolution to validate our scenario.

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A KINEMATIC STUDY OF DIFFERENT POPULATIONS IN THE GALAXY NGC 6822

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The kinematics of planetary nebulae (PNe) and HII regions in the irregular galaxy NGC 6822 is analyzed through high resolution spectroscopy from LCO-Clay-MIKE and OAN-2.1m-MES telescopes-spectrographs. The data have a resolution better than 10 km/s. The heliocentric radial velocities of these objects are compared to the kinematics of the extended HI disk found in this galaxy. The analysis shows that HII regions and other members of the young stellar population follow closely the rotation of the HI disk. On the contrary, PNe are not moving along with the HI gas and their kinematics is closer to the behavior of the spheroid of C stars, which is a system with different spatial distribution and kinematics. Thus we confirm that NGC 6822 has at least two very different kinematical systems with different spatial distribution: the rotating HI disk where the young population resides, and the stellar spheroid containing the intermediate-old population.

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