We present our results and compare them to other measurements of the density of the environment of galaxies, such as those in the MaxBCG catalogue of brightest cluster galaxies. As a control of our method, we apply it to a sample of galaxies from the 2MIG catalogue of isolated galaxies, and also to a sample of galaxies from a compilation of members of Abell clusters. We aim to use our results to test the morphology–local density relation and to study the relationship between the different types of emission-line activity of galaxies and their ambient density.

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GALAXY MODEL IN INFRARED

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We present in this work a new approach to the derivation of galactic parameters via the star counts method. It uses a modern version of the model of Ortiz & Lépine (1993) and the 2MASS data in J, H and K_S to estimate, based on a regular grid of lines-of-sight over the whole sky, the most important structural parameters of the Galaxy. It is the first time that the star counts method is used in the whole sky, including the complex region of the galactic plane. We have used a conservative approach to derive parameter values and their uncertainties, and also investigate the effects of using several limiting magnitudes over the best set of parameters which describes the Galaxy. Since the landscape for the figure of merit of a model can be pretty complex when we have a number of free parameters in excess of a dozen, the Markov Chain Monte Carlo method looks like ideal for an overview of the parameter space, to constrain regions of interest for further exploration and to provide realistic uncertainties. The pinpointing of the best parameter values is carried out with the Nested Sampling method, very robust in terms of progression to the optimum solution of a multi-parameter model.

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BAR AND SPIRAL ARMS DYNAMICS IN NUMERICAL SIMULATIONS

I. Puerari[1] and I. Rodrigues[2]

We present the results of SPH simulations with multi-million particles models. The models were constructed with an exponential disk, Spitzer's isothermal sheet in the vertical direction and a NFW halo. In models having a bulge, a spherical Hernquist profile was used. The models were evolved for approximately 5 Gyr using Gadget 2. We present 1D and 2D Fourier analysis to quantify bar characteristics as length, strength, and pattern speeds. Fourier 2D analysis is also applied to show the effects of the swing amplification mechanism. Indeed, the density waves begin to be amplified as tightly wound leading spirals and unwound to open leading structures. Afterwards, the waves wound into trailing patterns, reach their maximum amplitude and finally, fade away as tightly wound trailing spirals. The timescale for each wave packet is of the order of some 10^8 years.

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PHYSICAL PARAMETERS OF GALAXIES WITH STAR FORMATION THROUGH MID-INFRARED SED MODELS

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We present a mid-infrared study of a sample of 19 Starburst galaxies in the local (z<0.2) universe. We derive physical parameters such as Metallicity, Interstellar Medium Pressure, Compactness Parameter C (related to the dust heating flux), PDR Fraction f_{PDR} and Extinction A_V by fitting the Spitzer-IRS spectra of these systems using state-of-the-art radiative transfer models and Bayesian techniques. Our results are fundamental in the understanding of massive star formation in the local counterparts of intermediate and high redshift Ultra Luminous Infrared Galaxies (ULIRGs). We reconstruct the star forming histories of these systems by obtaining posterior probability distribution functions (PDFs) for the star formation rates in different epochs an estimate the contribution to the bolometric luminosity from very recent (< 1 Myr) star formation events, and the contribution of Polycyclic Aromatic Hydrocarbons, which is significant in some cases. By comparing the derived PDFs with particular spectral

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