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OPTICAL AND NEAR IR GALAXY NUMBER COUNTS IN THE GOYA SURVEY. THE AGES OF ELLIPTICALS

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Based on the GOYA Photometric Survey of the HST Groth-Westphal strip, we present galaxy number counts in B and Ks bands together with a model that simultaneously reproduces the counts and that does not need to add an extra population of blue dwarf galaxies to reproduce the blue excess of the counts at faint magnitudes.

The model uses the following components: a Λ-dominated flat cosmology; the SDSS local morphologically-dependent luminosity functions; number evolution from observationally-based z-evolution of the merger fraction; standard SEDs for the different galaxies types; and a typical optical depth ($\tau_B = 0.6$) for spiral and irregular galaxies. The only free parameter is the epoch of formation for the galaxies. Only by setting a recent formation redshift, $z_f \simeq 1.5$, for ellipticals, do the models reproduce the change of slope observed at Ks = 17.5mag in NIR counts (Figure 1). With this premise, only considering moderate optical depth, $\tau_B = 0.6$, for ellipticals do the models reproduce the B counts without leaving excesses in B number counts at intermediate magnitudes (Figure 2). This can be an indication of the presence of dust in the formation process of the ellipticals, which would decrease the UV flux produced in their formation via merging of disc galaxies. For more details see Eliche-Moral et al. (2006). The main conclusion of this study is that optical and IR observed galaxy number counts are compatible with:

- A relatively late, $z_f \simeq 1.5$ formation epoch (galaxy age 9.3 Gy) for the most of the ellipticals.
- The main process of formation of these ellipticals is merging of dusty disk galaxies.
- That the blue count excess at faint magnitudes can be explained with the near blue dwarf galaxy plus the far blue small galaxies which are the consequence of the inverse process of galaxy mergers.

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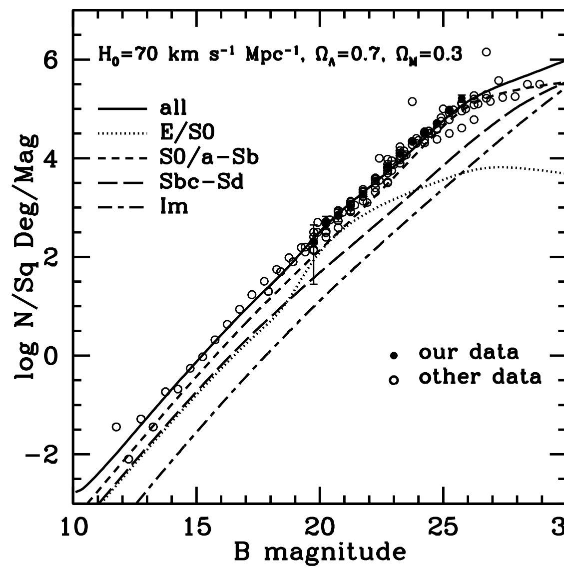

Fig. 1. The model of galaxy number counts overplotted on the observations in the B filter.

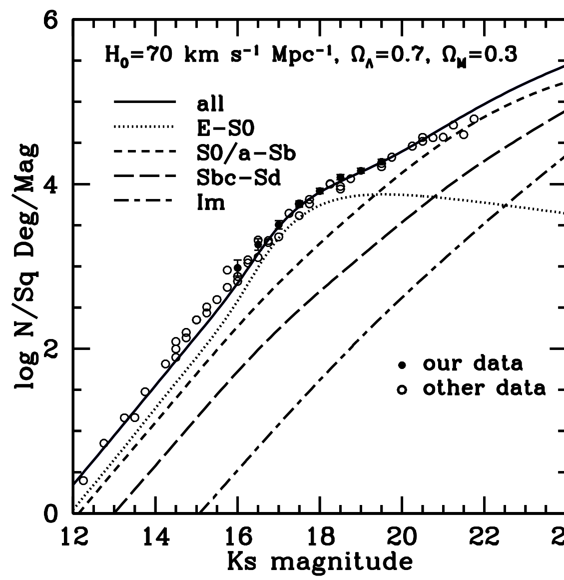

Fig. 2. The model of galaxy number counts overplotted on the observations in the Ks filter.

REFERENCES

Eliche-Moral, C., et al. 2006, ApJ, 639, 644