# Morphology and Models of Faint Galaxy Counts

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Most models of faint galaxy counts continue to rely on transforming observed distributions of morphology of local galaxies to estimate the distribution of K corrections. Such procedures have led many groups to conclude that the observations and the predictions from standard no-evolution or mild luminosity evolution models are so discrepant that more exotic models are needed. Some examples include rapid mergers, new populations of galaxies at high redshift that disappear by today, dramatic enhancements of star-formation among low luminosity dwarfs, and even a high cosomological constant.

We stress that the transformation from morphology to an estimate of the intrinsic color is subject to a number of uncertainties. Some obvious ones include the observed wide spread in colors of any given morphology type; the possibility that the luminosity function versus morphology found in the Virgo cluster may not apply to the general field; or the danger that important classes of objects (very compact blue galaxies, interactive systems, peculiar galaxies, low-surface brightness galaxies, etc.) have not been properly accounted for.

We have developed a new technique to derive the luminosity functions of galaxies with different K corrections that bypasses any of the local determinations of either morphology or luminosity function. The method uses a non-negative least-squares fit to the observed counts, colors, and redshift distributions from $B \sim 15$ to 24 and fainter. Even without any evolution, the model fits to the $B, r, K$ counts are far superior to prior models. For example, at $B \sim 24$, our no-evolution models predict counts that are only 50% shy of the observed (Koo, Gronwall, & Bruzual 1993, ApJL, 415, L21). This is an order of magnitude improvement over that of previous models which had predicted counts low by factors of 5 to 15. New evolutionary models that included standard luminosity evolution were presented (Gronwall & Koo 1994, ApJL, submitted). These new models further improved the fits. We thus conclude that the need for extensive amounts (factors of 2 or more) of exotic components to galaxy evolution models are premature.

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