NUMBER COUNTS AND EVOLVING DWARFS

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Recent redshift surveys (eg. Colless et al. 1993) have shown that the excess galaxies seen in faint B band number counts are not evolved giants at high redshift, but low to moderate luminosity objects at modest redshifts. This led to the suggestion (eg. Cowie et al. 1991) that there was once an extra population of dwarfs which has now disappeared, ie. there is non-conservation of galaxy number. We have investigated a picture in which the dwarfs have merely faded to become very low surface brightness galaxies like those now turning up in nearby clusters (eg. Turner et al. 1993).

The key features of our model (see Phillipps & Driver 1995) are (1) a separate steeply rising ($\alpha = -1.5$) LF for the dwarfs in addition to the standard ($\alpha = -1.0$) Schechter function at brighter magnitudes ($M^*_{dwarfs} = M^*_{giants} + 3$), (2) a rate of fading of these dwarfs consistent with models of simple 1 Gyr duration starbursts, and (3) due allowance for selection effects which limit the detectability of low surface brightness objects. By varying the relative numbers of dwarfs and the rate of fading we have been able to produce a model with conservation of galaxy numbers which does indeed fit the steep number counts, the redshift distributions *and* the local LF. This model has a large population of dwarfs ($\phi^*_{dwarfs} \simeq 2\phi^*_{giants}$) which fade by 1.8^m since $z \simeq 0.5$ *and* has a wide range of surface brightnesses so that only about 60% of the dwarfs are detectable in the type of local surveys used to determine the LF.

References

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