

SIT SPECTRA OF FAINT FIELD GALAXIES

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Digital SIT spectra have been obtained in collaboration with J.E. Gunn and W.L.W. Sargent for a sample of 49 field galaxies chosen from Kron's survey of selected area 68. Most have apparent visual magnitudes in the range 19 to 21. Redshifts have been measured for 48 of the 49 galaxies. The redshift (or, equivalently, luminosity) distribution for the sample is anomalous in that $\approx 10\%$ of the sample has $z \geq 0.3$ (and, thus, $L \geq 6 L^*$). These high z and L galaxies are among the bluest objects in the sample. These data require substantial evolution of at least some galaxies at small z . It is tempting to speculate that this luminous, blue field galaxy population is related to the Butcher and Oemler blue cluster galaxies found in the same redshift range.

DISCUSSION

G. Burbidge: You say that no galaxies with small redshifts have such large luminosities. Is it not the case that several galaxies in this category have been found?

Turner: It is true that a few nearby giant spiral galaxies are known to have such high luminosities and blue colors. The point is that the relative frequency of such objects increases by rather more than an order of magnitude for galaxies at 20th magnitude as compared to samples at much brighter apparent magnitudes. These "extra" luminous blue objects have redshifts near 0.4.

Tyson: Assuming your proposed galaxies are standard candles of luminosity L^* , our J-band galaxy number counts at 24th magnitude ($z \sim .5$) can set upper limits to the number of such galaxies.

Turner: In other words, if one wanted to explain these galaxies by simply increasing the luminosity of all galaxies at $z \geq 0.4$ by some multiplicative factor, one would also have to predict an unobserved feature in the faint galaxy counts. I haven't yet tried to make any models, but that certainly sounds plausible.

G.O. Abell and P. J. E. Peebles (eds.), Objects of High Redshift, 71-72.
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Hawkins: To what extent did your selection criteria avoid bias in favour of selecting more luminous galaxies?

Turner: The sample was selected such that each galaxy is intended to be a random galaxy of its particular apparent magnitude. I know of no bias in favor of giant, luminous galaxies. It seems more likely that a few dwarf galaxies of low surface brightness might have been omitted, but, obviously, this could not explain the bright galaxy anomaly.