

Abstract: ESO Workshop on the Bottom Of the Main  
Sequence - And Beyond

VLM Stars toward the Barnard 5 Molecular Cloud

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The faint end of the LF is poorly known for stars with masses below 0.4 Mo, Concerns regarding the behavior of the low end of the LF continue to center on issues of selection bias, poor statistics, and completeness. Our research program addresses these issues. It consists of a study of the field star LF down to the very faint limiting magnitudes and is dominated by stars located in regions considerably beyond the Solar vicinity. The program uses nearby dark molecular clouds as distance-limiting opaque screens to study the LF. Very deep surveys for intrinsically faint stars are usually confounded by the presence of more luminous, distant stars of similar colors. The screen technique for the most part avoids this difficulty, accurately confining the sample of foreground stars and minimizing the confusion caused by background cool giants. The background objects chosen for survey are the extended, heavily obscured Taurus, Rho Oph and Barnard 5 (B5) molecular clouds. All have very high extinction cores suitable for this study, which are of comparable extent. The observations thus far have consisted of deep CCD multicolor (VRI) photometry of the three regions using the KPNO 0.9-m and 4-m telescopes.

Preliminary results indicate a total number of stars within the volumes limited by the clouds that significantly exceeds the sum predicted using a Wielen luminosity function. The excess appears to be dominated by very faint, low mass stars, suggesting that the LF begins to rise after the sharp fall-off seen in all luminosity function surveys. In this paper we present the B5 results.