THE MACHO EFFECT OF BINARIES AND PLANETARY SYSTEMS

A.D. Bolatto
Depto. de Astronomía, Fac. de Ciencias, Uruguay
and
E.E. Falco
Harvard-Smithsonian Astrophysical Observatory, U.S.A.

We present preliminary results of an alternative approximation to estimate the detection probability of binary MACHOS ("Massive Astrophysical Compact Halo Objects") in a systematic search of High Amplification Events (HAE) carried over stars of the Large Magellanic Cloud. Our approach (based on that of Mao & Paczyński 1991, ApJ, 374, L37) consists of calculating the gravitationally microlensed light curves for binary systems that contain one stellar point mass and a companion with mass ratios ranging from 0.001 to 0.01 (in other words, a double Schwarzschild lens). In the cases we are calculating, the source appears point-like. The physical properties of such a system depend on four parameters, the mass ratio, the separation between the two components, the impact parameter with respect to the primary, and the angle of incidence of the trajectory of the source. We characterize the probability of detection of binary microlensing through the functional distance between the binary light curves and that for a single point with the mass of the primary star. Our current results are a family of curves of cross-sections, parameterized by the separation between the binary components, as a function of impact parameter. We plan to complete our calculations for a wide range of cases of interest, and then to estimate probabilities of detection of planetary-type systems. Based on our preliminary results, we expect to find a reasonable probability of detection of such systems, as was anticipated by Mao & Paczyński (1991).

BAR INDUCED PERTURBATIONS ON THE LMC DISK

H. Dottori[1], E. Bica[1], J.J. Clariá[2], and I. Puerari[1,3]

We analyse the spatial distribution of SWB I and SWB II LMC clusters from the recently enlarged total sample of 624 objects in *UBV* photometry. The two distributions present a relative angular shift of $\approx 20°$ in their bar structure, suggesting a bar induced sequential star formation in the disk. Both SWB groups also present different patterns throughout the disk. We perform a Fourier analysis, which reveals in both cases the predominance of one —and two-armed components. The two-armed component shows clearly the bar angular shift. A comparison with literature models of off center bar in a disk shows a close agreement for the overall pattern and the density wave character. The spatial distribution of clusters younger than 10 Myr is also studied. The Fourier analysis reveals the predominance of odd armed components. The trailing character appears as in the models although disturbed by the local shell-induced star formation. The latter phenomenon smears out in the older groups SWB I ($\approx 10 < t$(Myr) $< \approx 30$) and II ($\approx 30 < t$(Myr) $< \approx 70$).

[1] Instituto de Física, Universidade Federal do Rio Grande do Sul, Brazil.
[2] Observatorio Astronómico, Universidad Nacional de Córdoba, Argentina.
[3] Observatoire de Marseille, France.

PROPAGATION OF STAR FORMATION SOUTH OF 30 DOR?

Eva K. Grebel and Jorge Melnick
European Southern Observatory, Chile

We analyzed *UBV* Johnson CCD photometry taken with the 3.6-m telescope at ESO, La Silla, of two regions south of 30 Dor. The first region comprises the OB association LH90 and surroundings, while the second region contains LH93, 94, 96, and 97.

We find that in the area containing LH90 star formation propagated from the SE to the NW. LH90 itself consists of a B star dominated southern cluster, an O and WR star dominated central cluster, and an O star dominated region west of it. The latter is the youngest region, located just at the border of an area with high dust obscuration, where star formation may still be continuing. These findings are corroborated by spectroscopy for the central region of LH90 [Schild & Testor 1992, A&AS, 92, 729), Heydari-Malayeri, Melnick, Jorda, & Grebel 1993, (in preparation)].

In the second region, no propagation of star formation is visible. A young population with low spatial density is superposed on an old underlying population. Even though there is some age spread in the young population (tentative age estimates give some 10–30 Myr), no evidence for propagating evolution can be seen.