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Session 17: Stellar Evolution
Oral Session, 10:00–11:30 am
Wyndham B

17.02

Masses of the Double-Mode RR Lyrae Stars

N.R. Simon (Univ. Neb.) and A.N. Cox (LANL)

We re-examine the double-mode RR Lyrae (RRd) mass determination using both new and previously existing linear pulsation models. The independently written Los Alamos (Cox, et al. 1983, Ap. J. 266, 94) and Aikawa (Aikawa and Simon 1983, Ap. J. 273, 346) pulsation codes both yield "canonical" values for the RRd masses, i.e., $0.55 M_{\odot}$ for Oo I clusters, and $0.65 M_{\odot}$ for Oo II clusters. These results are essentially independent of reasonable changes in helium abundance, the treatment of convection and the formulation of standard opacities. We show that recent contrary results by Petersen (1990, preprint) are almost certainly due to the use of an adiabatic approximation and inappropriate metallicity. Given this, it is further argued that earlier discrepant results due to Kovacs (1985; Acta Astr. 35, 37) ought not to be given a high weight. Finally, we concur with Petersen's (1990) assertion that the Oo I RRd masses could be increased provided that Population II metal opacities turn out to be very high.