1981

Experimental Envelope Models for Cepheids

Norman R. Simon
University of Nebraska - Lincoln, nsimon@unl.edu

35.04 Experimental Envelope Models for Cepheids. N.R. SIMON, U. Neb.-Lincoln. Numerical experiments are conducted with a view toward constructing Cepheid models which satisfy observational and theoretical constraints. Pulsation analysis is performed in the linear theory. Radiative models are studied, as well as those in which the H-zone is spread in a manner that mimics the effect of mixing-length convection. When the influence of convection on pulsation is examined in two artificial limits, adiabatic and isothermal, the former is found to be unsatisfactory, the latter tentatively acceptable. Following the results of earlier investigations, we test the effect of opacity on pulsational period ratios. It is found that an approximate doubling of the envelope opacity for temperatures $\gtrsim 10^5$ K seems sufficient (this work is still in a preliminary stage) to satisfy observational constraints with otherwise normal evolutionary models in both the double mode and bump Cepheid domains. This work is supported by the National Science Foundation under Grant # AST 8105064.

Bulletin of the American Astronomical Society, Vol. 13, p. 871 (1981)