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Cephid Velocity Curves

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30.03 Cepheid Velocity Curves, N. R. SIMON, A. S. LEE and T. J. TEAYS, Univ. of Neb.-Lincoln. Fourier decompositions are made for a number of observed velocity curves of classical Cepheids. The observations are fit with Fourier series of the form

$$v_{obs} = A_0 - A_i \sin(i\omega t + \phi_i) ,$$

where the index i runs from 1 to 4 or 1 to 8 depending upon the requirements of the data. Although the sample of stars is small, we show that the Hertzsprung progression expresses itself quantitatively in terms of the low-order Fourier coefficients, particularly the quantity $\phi_{21} \equiv \phi_2 - 2\phi_1$. This result complements a similar finding for the light curves. When the Fourier decompositions of the velocity curves are compared with those of some theoretical models (Vermury and Stothers 1978, Ap. J. 225, 939), new evidence is uncovered favoring a resonance explanation for the "bump" sequence. This research was partially supported by the National Science Foundation under Grant No. AST79-05290.