

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS

Number 1339

Konkoly Observatory
Budapest
1977 September 16

POSSIBLE RELATION BETWEEN THE PULSATION CONSTANT AND
THE PERIOD IN DELTA SCUTI VARIABLES

Owing to theoretical arguments and observational results of Delta Scuti stars, the pulsation constant has been considered variable with the mode of pulsation but constant for each mode (Cogan 1970, Chevalier 1971, Petersen and Jørgensen 1972, Jørgensen and Petersen 1974).

Nevertheless, the observed Q and P reported by Breger and Bregman (1975), plotted in Figure 1, seem to show a continuous relation between Q and P .

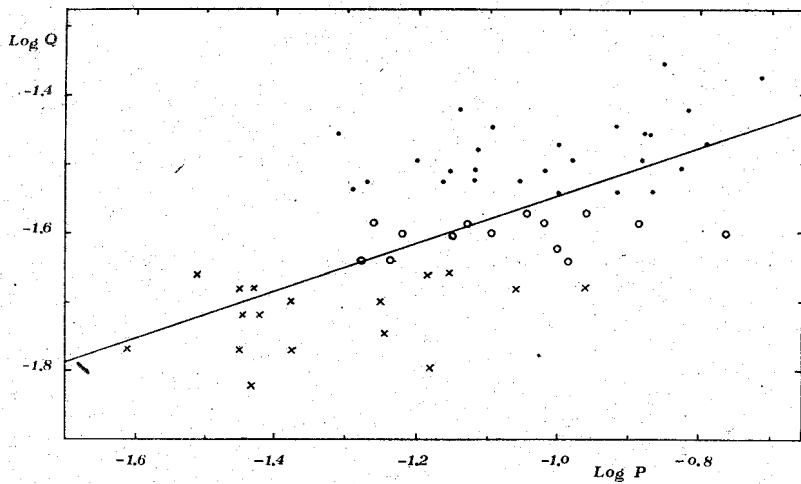
Further, if we consider the two zones of the diagram M_V vs T_e reported by Breger and Bregman (1975) as representative for "hot" and "cold" variables, pulsating respectively in the first and fundamental overtone, we can compute the fundamental period of the "hot" variables multiplying their periods by $P_0/P_1 = Q_0/Q_1 = 1.324$. Then, from the data by Breger and Bregman (1975), by least squares, we can obtain

$$\log Q_0 = 0.22 \log P_0 - 1.30.$$

± 0.11	± 0.08	± 0.09
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This relation could lessen the discrepancy between the theoretical and the empirical relation $M_{bol} = M_{bol}(P, T_e, M)$, and make more acceptable the values of the masses presently adopted for Delta Scuti stars.

We believe that it should be useful to take in account the above mentioned remarks in the theoretical models of Delta Scuti variables.



Values of Q (Breger and Bregman, 1975) versus periods for Delta Scuti stars: • fundamental mode, $Q \geq 0.29$; ○ first overtone, $0.23 \leq Q \leq 0.29$; x second overtone, $Q < 0.23$.

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References:

- Breger, M. and Bregman, J.N. 1975, *Astrophys.J.* 200, 343
 Chevalier, C. 1971 *Astron. and Astrophys.* 14, 24
 Cogan, B.C. 1970, *Astrophys.J.* 162, 139
 Jørgensen, H.E. and Petersen, J.O. *Astron. and Astrophys.* 35, 215
 Petersen, J.O. and Jørgensen, H.E. 1972, *Astron. and Astrophys.* 17, 367