

# Variable Stars in the Sculptor Dwarf Galaxy

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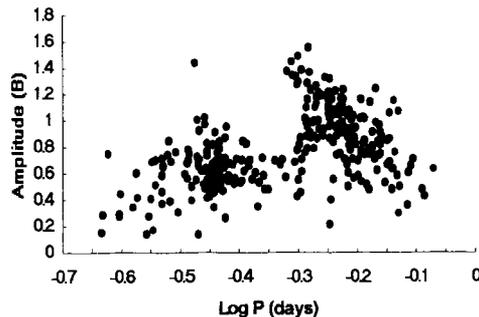
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## 1. Introduction

This project was initiated in 1985 by James Nemec (University of Washington) and Nicholas Suntzeff (C.T.I.O.). The goal was to study the system of  $\sim 600$  variable stars in the Sculptor dwarf galaxy. In 1987 the author became the recipient of the plate collection, which formed the basis for his Ph.D. dissertation. In this paper preliminary results are presented. Briefly, 612 stars were studied, of which 432 are van Agt (1978) stars and 180 are newly discovered variable stars. A total of 381 stars are confirmed variables. Most of these are RR Lyraes, but many anomalous Cepheids and some candidate eclipsing variables were also found. Several candidate double-mode RR Lyrae stars were also identified. The mean period of the *ab*-type RR Lyrae stars is  $0.60 \pm 0.08$  day, and the mean period of the *c*-type stars is  $0.35 \pm 0.03$  day, not unlike the mean periods of other nearby dwarf galaxies.

## 2. Period-Amplitude Diagram

Figure 1 shows the period-amplitude diagram for the RR Lyrae stars in Sculptor. The *ab*-types show the characteristic decrease in amplitude with increasing period, the longest period being  $\sim 0.80$  day, characteristic of a very low metal abundance. Also, the  $P$ - $A_B$  relationship is significantly wider at a given amplitude than that for globular clusters (Sandage 1981), probably largely due to a range in metallicity for the stars. The slope of  $P$ - $A_B$  relation appears to be shallower than that for globular clusters. Several stars may also be misclassified in this diagram.



**Figure 1.** Period-amplitude diagram for the Sculptor variables.

## References:

- Sandage, A., 1981, *Astrophys. J.* **248**, 168.
- van Agt, S., 1978, *Publ. David Dunlap Observatory*, Vol.3 (number 7).