AGB STARS IN THE GALACTIC BULGE
OBSERVED BY DENIS

M. SCHULTHEIS
Institut für Astronomie der Universität Wien, Austria
G. SIMON
Observatoire de Paris, France
AND
J. HRON
Institut für Astronomie der Universität Wien, Austria

Abstract. We present first results of DENIS photometry for semiregular variables (SRVs) and Miras in field #3 of the Palomar-Groningen survey (PG3, \( l = 0^\circ, b = -10^\circ \)). The PG3 Miras and SRVs are located in the colour-colour diagram (CCD) in both colours at the reddest end. PG3 variables show a large scatter in \((I - J)_0\) while in a \(K_S/(J - K_S)_0\) diagram they are situated at the top of the red giant branch. In contrast to the LMC we do not find any carbon star sequence which is due to the different age and metallicity of the Bulge. PG3 variables follow a PC relation as well as a period-luminosity relation.

1. Introduction

PG3 (field #3 of the Palomar-Groningen Variable Star Survey; \( l = 0^\circ, b = -10^\circ \)) is well searched for variable stars (Plaut 1971, Wesselink 1987). Blommaert (1992) studied the properties of the PG3 Miras while Schultheis et al. (1997) the properties of the SRVs. Besides near-Infrared photometry (JHKLM) obtained at the 1 m ESO telescope (now dedicated to DENIS), spectra and radial velocities are available. Schultheis et al. (1997) found that the PG3 SRVs are not the analogs of the field SRVs. The PG3 SRVs form a short period extension to the Miras PK and PC relations. This indicates that the PG3 Miras and SRVs are both pulsating in the same
mode, possibly the fundamental. The metallicity of PG3 is between half solar and solar. Both PG3 Miras and SRVs follow the SgrI PK relation which again stresses the metallicity independence of the PL relation. Ng & Schultheis (1997) found for a few faint AGB stars evidence that they are members of the Sagittarius dwarf galaxy. Two carbon stars found in PG3 might be member of the Sagittarius dwarf galaxy as well (Ng, 1997).

The main aim of this work is to obtain DENIS photometry for those well-known AGB stars. Their position in a colour-colour and a colour-magnitude diagram will help to search for more AGB stars candidates. Further on, DENIS will offer a good tool to study the stellar population related to the Sagittarius dwarf galaxy.

2. Selection of DENIS strips

Based on the coordinates of the PG3 variables we looked for 77 Miras and 78 SRVs in the DENIS archive. 21 PG3 Miras and 15 PG3 SRVs have been observed by DENIS up to now. At least two measurements for 6 Miras and 2 SRVs were obtained. Fig. 1 shows the observed DENIS strips of PG3.

![Figure 1](image-url)

*Figure 1.* Distribution of the PG3 variables in $\alpha$ and $\delta$. PG3 SRVs are indicated by triangles, PG3 Miras by squares. Solid lines mark the centre of the observed DENIS strips, the dashed ones indicate each 6'.

Total 8 strips were observed by DENIS where two of them were reobserved (see table 1), which gives a total number of \sim 80 frames. For two strips the quality is very poor and have to be reobserved. Note that we do not deal with full strips but with single frames.