

## POLARIMETRY OF SOUTHERN SYMBIOTIC STARS

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ABSTRACT. We present the first results of an ongoing survey of the linear polarization properties of symbiotic stars. With these multifilter optical measurements, we aim to obtain a statistically significant sample from which to study the nature and geometrical arrangement of their circumstellar matter and its relationship to the stellar components. Up to now, the observations show:

1. Among the five objects for which we have obtained a complete filter coverage, we find one new intrinsically polarized dusty object, BI Cru.

2. In total, intrinsic linear polarization is now detected in 9 out of 23 symbiotic stars.

3. Polarized symbiotic stars are observed at a slightly higher frequency when the associated cool component is of spectral type later than M4.

4. Intrinsic polarization is found to be more common among systems which belong to the D (warm dust) infrared type than among the S (stellar IR continua) type objects.

5. The three symbiotic subgroups S, D and D' seem to be distinguishable as well from the IRAS infrared observations. Intrinsically polarized objects occur in both type S and D objects of the IRAS sources.

We conclude, from our limited sample, that dust scattering in the asymmetric circumstellar environment of symbiotic systems does play a role in producing the polarization, at least in D-type objects. In S-type systems, photospheric scattering might originate part of the observed intrinsic polarization. The full results will be published elsewhere.

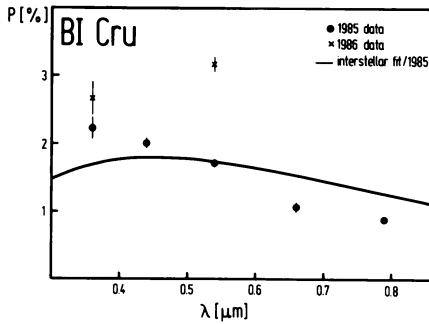


Table 1 : Southern Symbiotic Stars newly observed for Polarization

OBJECT	IR TYPE	SPECTRAL TYPE	INTRINSIC POL.
SY Mus	S	M4	no
BI Cru	D	M0 - M1	yes
RW Hya	S	M2	no
HD 330036	D'	F - G	no
RR Te1	D	> M5	no

Figure 1. The degree of polarization  $P$  versus wavelength for the D-type symbiotic BI Cru. The filled circles show the measurements taken in 1985. The data are not well represented by interstellar polarization alone. When measured again in 1986, as shown by the crosses, the polarization had varied significantly in the V-filter. We consider the observed polarization of BI Cru to possess an intrinsic component.

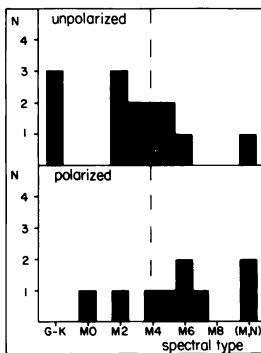


Figure 2. Histograms showing the distribution of unpolarized and polarized symbiotic stars in our sample by spectral type. There is a slight tendency for polarized objects to appear at later spectral types of the associated cool companions.

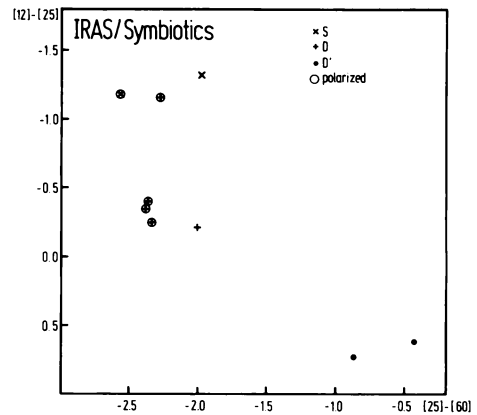


Figure 3. The  $(12\mu\text{m}) - (25\mu\text{m})$  versus  $(25\mu\text{m}) - (60\mu\text{m})$  IRAS colors separate well the three symbiotic types S, D and D'. R Aqr groups here with the S-type systems. More than half of the intrinsically polarized objects are present in this diagram.

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