UBVRI POLARIZATION MEASUREMENTS OF POST AGB STARS

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UBVRI polarization measurements of 25 post AGB stars with circumstellar dust shells (CDSs) were made. Most of them show A, F, G, K supergiant type spectra. IRAS data of these stars show evidence for the presence cool detached circumstellar dust envelopes. Some of these stars also have warm dust shells. Many show significant polarization. The observed polarization in UBVRI is most likely due to scattering of the central star radiation by CDSs. Some of these stars show variation in polarization and position angle. The polarization data suggest that several may have aspherical or bipolar CDSs.

From an analysis of the IRAS data a new class of stars were detected. They have CDSs with far infrared colours and flux distributions similar to the dust shells of PNe. Most of them show A, F, G and K supergiant-like spectra in the optical. Parthasarathy and Pottasch (1986), and Lamers et al. (1986) first detected these shells around high galactic latitude A - F supergiants and interpreted them as the result of severe mass loss experienced during their AGB stage. These stars are considered to be in the post AGB stage, evolving from the tip of the AGB to the left in the H - R diagram into the region of PNe.

In order to study the CDSs we made polarization measurements in UBVRI with a polarimeter on the 1-m telescope of the Indian Institute of Astrophysics, Kavalur, India. Some of the post AGB stars found show significant intrinsic polarization. Several of these stars are at high galactic latitudes; thus the expected interstellar polarization is much less than the observed values. In addition, the wavelength dependence of polarization of light of these stars is found to different from that of interstellar polarization. Also the position angle for interstellar polarization is independant of wavelength. For some of the stars we find significant change in position angle. Hence, the observed polarizations are intrinsic to the stars.

The detection of linear intrinsic polarization suggests the nonspherical distribution of circumstellar matter. Since these stars have CDSs, this indicates that the dust shells are responsible for the observed polarization. The observed polarization of light is due to the scattering of the radiation of the central star in non-spherical CDSs. Here, stellar light gets polarized by being scattered off the dust grains; an asymmetry in dust grain distribution around the star would then produce a net observable polarization.