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VARIABLE F-TYPE SUPERGIANTS FAR ABOVE THE GALACTIC PLANE

Supergiant variability in general is now well established. Still, the wide class of variable B-G-type supergiants is very heterogeneous.

However, several F-type supergiants seem to be strikingly similar as regards their photometric behaviour, galactic distribution and kinematics. Most typical representatives are UU Her, 89 Her, HD 161796, BL Tel (F) and HD 112374. Obviously, similar stars fainter than 7^m are not yet known to be variable due to their small amplitudes. Various aspects were discussed separately in recent papers of van Genderen (1977, 1980) for BL Tel (F); Percy et al. (1979, 1981), Burki et al. (1980) and Fernie (1981) for 89 Her and HD 161796; Arellano Ferro (1981) for HD 112374; and Sasselov (1981) for UU Her. The set of many-sided criteria that brings them together comes from our conception that these supergiants are unique luminous objects situated far above the galactic plane; being, also, outside the Cepheid instability strip and exhibiting (probably non-radial) pulsations. The latter seem to account for the quite specific light and radial velocity variations. These variable stars occupy a compact isolated area on the P-C diagram and do not obey the semi-period-L-C relation for "normal" supergiants (see Maeder, 1980). Probably other common features are their normal Population I abundances and mild infrared excess radiation (however, little information about these features is available up to now). The latter feature is quite interesting as most Population I supergiants do not have it.

Hence, we suspect the possible existence of a group of variable F-type supergiants obeying the following criteria:

- a) semi-regular light variations $\leq 0^m.6$ (usually $0^m.2$);
- b) periods (two or three alternating) from about 30 to 120 days;
- c) spectral type F0-F7 ($\langle B-V \rangle_0$ from +0.10 to +0.50);
- d) luminosity class Ib to Ia;
- e) $|z| \geq 1$ kpc;
- f) velocity is typical for Population II stars.

The five stars listed above obey strictly these criteria and about twenty other members of this group are suspected, as well. Our criteria re-

fect the fact that these supergiants differ unambiguously from all established types of variable stars.

The problem of how can such luminous and, probably, young objects be so away from the plane, i.e. the luminosity - high-galactic-latitude controversy, remains equally puzzling even if such non-variable stars exist. We have detected an interesting compact swarm of seven F-type supergiants around SA 28 far above the galactic plane which will be tested for light variability. These suspected new members of the group are: BSD 125 (SAO 42538), BSD 475 (SAO 42524), BSD 820 (SAO 42496), BSD 482, BSD 870 (SAO 42514), BSD 940, and BSD 1050 (SAO 42582), using data from Bartaya (1979). Two similar sets of five and seven stars are to be found nearby (around SA 27 and SA 11, respectively).

As regards 89 Her and HD 161796, Burki et al. (1980) discuss the luminosity - high-galactic-latitude controversy for them. No explanation can be favoured yet. The group of Cepheid-like variables proposed by Percy (1980) is very heterogeneous and most of its members do not obey the above criteria. Such surveys may be, however, quite valuable in discovering very long period Cepheids in our Galaxy.

A careful examination of Bartaya's catalogue (1979) down to 11^m makes us suspect that luminous F-type supergiants at high galactic latitudes are not so rare as they obviously are thought to (see, e.g. Burki et al., 1980). Their further investigation is evidently quite important.

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