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ULTRAVIOLET OBSERVATIONS OF THE R AQUARII JET

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Observations of the recently discovered jet feature in the symbiotic variable R Aquarii (M7e+pec) were obtained with the International Ultraviolet Explorer (IUE). A comparison of low dispersion UV-spectra reveals important differences between the central ionized source and the jet feature. The UV-continuum flux F_λ between 1200-2000A that rises with decreasing wavelength in the jet feature, essentially is independent with wavelength in the central compact nebula. The prominent emission lines of Si III] λ1892A and Si II λ1817A, evident in the central star, are virtually absent in the jet. The carbon lines of C IV, C III] and C II also suggest the general excitation of the jet is comparatively lower than the central star. This is further indicated by enhanced S II λ1250, 1295A and C II λ1335A emission in the feature. We speculate that material that is ejected from the symbiotic system cools through free-free and nebular recombination emission.

The jet or "spike" so-called by Wallerstein and Greenstein (1980), first appeared sometime between 1970 and 1977. Herbig (1980) reported moderate ion excitation in the jet from optical spectra that consists of [S II], [O II], [O III] and He I. Subsequent observations obtained with the VLA at 6 and 1.3 cm (Sopka et al. 1982) indicate the feature is also present in the radio. The relationship between the jet and outer extended 2-arcmin nebulosity is not clear at present. However, Lick 3-meter direct plates obtained by Herbig (1980) indicate material is ejected along an axis perpindicular to the 2-arcmin nebulosity that encircles the central object. We find that the UV-continuum from the jet feature could be the result of dust-scattered stellar continuum from the central ionizing star similar to that suggested for Herbig-Haro objects. Si may be depleted in the jet, although the prevailing lower temperatures could promote the formation of silicate grains. A model explaining the appearance of the feature has been suggested by Kafatos and Michalitsianos (1982) that involves episodic mass transfer in a highly elliptical binary system.

Herbig, G. 1980, I.A.U. Circular no. 3535.
Kafatos, M. and Michalitsianos, A.G. 1982, Nature (letter), in press.
Sopka, R.J., Herbig, G., Kafatos, M. and Michalitsianos, A.G., Ap.J., 258, L32.
Wallerstein, G. and Greenstein, J.L. 1980, Pub. Ast. Soc. Pacific, 92,275.

Richard M. West (ed.), Highlights of Astronomy, Vol. 6, 639.