

**Title:** Mira Variable Stars in the Far-UV: Results from FUSE  
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### **Abstract**

We have obtained a FUSE spectrum of the long-period variable star S Car -- a high-velocity Mira-type variable. This observation gives us the opportunity to probe the temperature- density structure the outer shocked region of the atmosphere of this star using the hydrogen Lyman lines. We obtained an LWRs spectrum in late-May 2001 when this star was at optical light-curve phase 0.35. A very weak emission feature is (possibly) seen just above the noise in this spectrum at the location of the Lyman-beta line. We make flux comparisons between this possible detection of the Lyman-beta line, UV emission lines, and hydrogen Balmer lines obtained at coincident phases in earlier cycles with the IUE and ground-based optical telescopes. This is done to study the effect that the radiation field from the inner, hotter shocks (where Mg II and the Balmer lines form) have on the outer shocked region (where the Lyman lines form). We also make comparisons to synthetic spectra from dynamic models representative of this star. These NLTE radiative transfer calculations have shown that the radiation field of the inner shocks dominate the ionization throughout the entire atmosphere. The calculations also have shown that the Lyman emission lines form in the outer reaches of the atmosphere where the shocks are much weaker as they propagate outward.

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