

X-RAY AND UV EMISSION FROM VV PUPPIS

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We have discovered hard and soft X-ray emission from VV Puppis, the last of the four classical AM Her stars to be detected in X-rays. The orbital light curves in both soft and hard X-rays are in excellent agreement with the mean optical light curve, indicating that essentially all of the accretion luminosity originates from a very small region at the white dwarf's magnetic pole. An X-ray dip occurs once per binary period, when the magnetic pole lies closest to our line of sight, and is probably due to absorption. The X-ray data and optical spectroscopy constrain fairly well the geometry of the system, dictating an inclination angle $i < 70^\circ$ and a mass for the white dwarf in excess of $1.1 M_\odot$. X-ray and UV observations constrain the temperature of the soft X-ray component to lie in the range 20-45 eV, while the hard X-ray component has a temperature in excess of 6 keV. The observed flux of soft X-rays is much larger than that of hard X-rays. However, when the energy bandpasses of the observations are taken into account, the ratio of the soft and hard X-ray luminosities $L_s/L_h = 0.5-50$. The ratio is unity for $T_{bb} = 30$ eV and $T_{br} = 50$ keV; it is smaller if T_{bb} and/or T_{br} are larger and is larger in the opposite case. These results, taken together with those for AM Her using the Einstein OGS, suggest that the famous "soft X-ray problem" in the AM Her stars may have gone away.