

# The peculiar X-ray/UV accretion rate schism in the puzzling dM+DA binary QS Vir

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## Abstract

The period distribution of close binaries, cataclysmic variables, novae and single-degenerate SN1a progenitor candidates is largely controlled by magnetically-driven mass and angular momentum loss (AML) from the M dwarf secondary. The mass loss rates for these spun-up stars remain essentially unknown and impossible to observe directly, with likely values in the range  $10^{-12}$ - $10^{-15} M_{\odot} \text{ yr}^{-1}$ . We began studying the detached close dM+DA binary QS Vir to crack this problem, using observations of the M dwarf wind accreting onto the WD as probe of the M dwarf mass loss rate. But we found X-ray and UV diagnostics give accretion rates differing by 2-3 orders of magnitude! We present HST and XMM-Newton data that illustrate the problem which is yet to be resolved. The most likely explanation is additional mixing processes in cool WD atmospheres that decrease effective diffusion timescales for metals.