

EFFECTS OF NUCLEAR BURNING ON X-RAY AND UV EMISSION FROM ACCRETING
DEGENERATE DWARFS *

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The energy liberated by nuclear burning of matter accreting onto degenerate dwarfs can be more than an order of magnitude greater than that available from the release of gravitational potential energy. Nuclear burning therefore significantly alters the characteristics of X radiation from such stars. Here we report the results of two-fluid calculations in which steady burning occurs at various rates, and compare them with our earlier calculations which assumed no burning. If the star has a weak or no magnetic field, we find that nuclear burning enhances the soft X-ray flux emitted from the stellar surface, increases Compton cooling of the emission region and therefore reduces the hard X-ray luminosity and softens the hard X-ray spectrum. On the other hand, if the star has a strong magnetic field we find that nuclear burning enhances the soft X-ray flux emitted from the stellar surface but has little effect on the hard X-ray luminosity and spectrum. We apply the results of our calculations to the AM Her sources and to cataclysmic variables such as SS Cyg and U Gem, and discuss the evidence for and against nuclear burning of accreted material in these objects.

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