

WHAT DETERMINES THE SPEED CLASS OF A NOVA?

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Recent theoretical hydrodynamic models show that novae of different speed class can be obtained by varying the CNO enrichment and envelope mass. Recent observations of old nova shells, uncontaminated by disc or stellar emission, indicate that various degrees of CNO enrichment are found in slow novae. Using Prialnik et al's (1978) finding that the "shut-off" mechanism of novae is fuel exhaustion, i.e. expulsion of most of the hydrogen-rich envelope by means of an optically thick wind, we propose the following unified picture for novae:

- 1) CNO enrichment \tilde{Z} and envelope mass M_{envel} together determine the speed class of a nova.
- 2) \tilde{Z} is determined by the accretion mechanism and convective efficiency on the white dwarf surface.
- 3) M_{envel} is determined by the nature of the binary system and by the accretion rate \dot{m} .
- 4) Fast novae tend to have larger \tilde{Z} and smaller M_{envel} than slow novae, but CNO-rich slow novae and CNO-poor fast novae are permitted with certain envelope masses. We present below a qualitative diagram of the $M_{\text{envel}} - \tilde{Z}$ plane.

