

## Synthesis of radioactive nuclei and gamma-line radiation from novae

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A possible range of radioactive nuclei abundances in CO and ONeMg nova ejecta was found on the basis of kinetic computations of the thermonuclear burning in the one-zone hydrogen-rich envelope. The total amount of radioactive N, O and F isotopes in the model envelope is determined by the amount of dwarf CO matter admixed during the accretion and/or outburst. The fraction of synthesised  $^{18}\text{F}$  is 0.1–1% by mass. We calculated light curves of annihilation line from the short-lived NOF isotopes for various envelope parameters (expansion velocity, mixing degree) and expansion kinematics (free expansion against wind-like outflow). Light curve as a rule consists of two major peaks. Their intensity is sensitive to the degree of mixing of radioactive isotopes in the envelope. The presence of only one per cent of unmixed matter in the outer layer leads to the strong suppression of the first luminosity peak related to radioactive N and O isotopes. However, the second luminosity peak determined by  $^{18}\text{F}$  decays survives if the fraction of the outer unmixed layer is less than 10%. We propose to use  $^{18}\text{F}$  annihilation line flux observations by CGRO and INTEGRAL and independent estimate of the total amount of synthesised  $^{18}\text{F}$  from the  $^{18}\text{O}$  mass in the envelope to assess the mixing degree of radioactive nuclei. Calculations of the amount of synthesised  $^{22}\text{Na}$  and  $^{26}\text{Al}$  are compared with upper limits from gamma-ray observations.