

The energy source of intermediate luminosity optical transients

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(Submitted on 18 Jul 2011)

We argue that transient systems with luminosity between novae and supernovae (SNe) are powered by gravitational energy of mass accreted onto, or a companion merges with, a main-sequence star. These transient events are termed Intermediate-Luminosity Optical Transients (ILOTs; other terms in use are Intermediate-Luminosity Red Transients and Red Novae). We show that despite the wide range of 10^{45} - 10^{50} erg, the typical energy released by ILOTs can be expressed as a function of fundamental variables: the planck constant, speed of light, gravitational constant, electron mass, neutron mass, and ignition temperature of hydrogen. This expression explains why ILOTs are located between SNe and novae with respect to their total energy. We also put an upper limit on the power (luminosity) of ILOTs, which explains their lower luminosity than SNe.

Comments: Presented at the Intermediate-Luminosity Red Transients meeting, STScl, Baltimore, USA, June 28-30, 2011 (7 pages)

Subjects: **Solar and Stellar Astrophysics (astro-ph.SR)**

Cite as: **arXiv:1107.3454 [astro-ph.SR]**
(or **arXiv:1107.3454v1 [astro-ph.SR]** for this version)

Submission history

From: Noam Soker [[view email](#)]

[v1] Mon, 18 Jul 2011 14:42:51 GMT (15kb)

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