

## SN2015bh in NGC 2770: LBV core collapse in merging of binary system components

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### Abstract

© 2016, Pleiades Publishing, Ltd. We present spectroscopy and multicolor photometry for the optical transient PSN J09093496+3307204 in the galaxy NGC2770, which has afterwards been transferred into the supernova phase and got the name SN2015bh. Medium-resolution spectral observations were carried out between February 2015 to May 2016 using the focal reducer SCORPIO at the 6-m Russian telescope BTA. They were followed by photometric observations at the BTA and six other telescopes with 0.5–1m apertures. Both at the phase of the SN impostor (2015a) and at the supernova phase (2015b), besides Balmer emissions, the strong Fe II emissions are seen in the spectrum; so, these spectra resemble those of Williams Fe II type classical novae. Taking into account circumstellar, interstellar and galactic absorption,  $A_V = 1.4 \pm 0.15$ , we determined maximum absolute magnitudes of the object to be  $M_V = -15.0 \pm 0.3$  at the 2015a phase and of  $M_V = -18.14 \pm 0.30$  at the 2015b phase. The light curve at the 2015b phase is similar to those of SN IIL. The supernova progenitor is a luminous blue variable (LBV) star with the powerful H $\alpha$  emission. We consider several hypotheses of supernovae explosions following optical transients related with LBV. The hypothesis of core collapse of an evolved massive star interrupting the process of its merging with massive companion in a binary system (a failed luminous red nova) was chosen as the preferable one for this event.

<http://dx.doi.org/10.1134/S1990341316040052>

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### Keywords

general—novae, cataclysmic variables—supernovae, individual, PSNJ09093496+3307204, SN2015bh, supernovae