

Photometry and spectroscopy of the Fell nova AT 2020lrv still rising in brightness

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AT 2020lrv (= PGIR20dsv = ASASSN-20ga = ZTF20abdpwst) has been discovered on June 1 the Palomar Gattini-IR survey and classified as a nova on a spectrum taken on June 8 with the Palomar 60-inch telescope (ATel #13790). An infrared spectrum obtained with NASA IRTF 3.2 telescope on June 11 (ATel #13801) indicates a FeII-type for the nova and shows P-Cygni profile for many observed lines, with absorption minima for the hydrogen lines separated by ~ 370 km from the emission. A non-detection in X-rays on a June 13 pointing with the Swift satellite has been reported (ATel #13804).

We have been recoding BVRI photometry of the nova since June 5, and observed a steady increase in brightness with time, with no clear sign of maximum brightness having been reached yet. Our last measurements (fully transformed to Landolt equatorial system) give $V=13.215$, $B-V=+1.752$, $V-R=+1.100$, $V-I=+2.153$ for June 13.940 UT and $V=13.087$, $V-R=+1.105$ and $V-I=+2.154$ on June 14.943 UT. Comparing with intrinsic color of novae at maximum brightness from van den Bergh and Younger (1987, A&AS 70, 125), a reddening $E(B-V)=1.52$ is inferred, confirming the high extinction anticipated on the base of 3D Galactic extinction maps (as noted in ATel #13790).

A low resolution spectrum of AT 2020lrv (2.31 Ang/pix, 3300-8000 Ang) has been obtained with the Asiago 1.22m telescope on June 13.011 UT. P-Cyg profiles with deep absorption and only weak emission affect all Balmer lines, NaI doublet, OI 7772 and various FeII multiplets (most notably 42, 48, 49, 55, 73 and 74). All absorptions show two components, the bluest on average at -1275 and a much stronger one at -610 km/s from the emission component. The latter on average is characterized by FWHM=770 km/s (corrected for instrumental resolution). A full assortment of interstellar features (NaI and many diffuse interstellar bands) are all in strong absorption.

Another low resolution spectrum of AT 2020lrv has been obtained with the Stroncone 50cm telescope on June 13.917 UT (1.12 Ang/pix, 4665-6720 Ang). Compared with the spectrum obtained with the 1.22m telescope on the previous night, the emission component of P-Cyg profiles has further weakened, being barely visible (or not at all) on lines other than H α . On this spectrum, the absorption components to H α are still around -1200 and -620 km/s from the emission.

An underexposed Echelle spectrum has been obtained on June 15.05 UT with the Varese 0.84m telescope. On this spectrum, the emission and the main absorption component of the P-Cyg profile for H α are located at heliocentric velocities of -550 and +70 km/sec, and their FWHM (corrected for instrumental resolution) are 210 and 680 km/s, respectively.