Spectroscopic follow-up observations of Nova Herculis 2021

ATel #14718; I. Albanese, A. Farina, V. Andreoli, P. Ochner (UniPd), A. Reguitti (UNAB) on 15 Jun 2021; 13:29 UT

Credential Certification: Andrea Reguitti (andreareguitti@gmail.com)

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We report spectroscopic follow-up observations of Nova Herculis 2021 (TCP J18573095+1653396). It was discovered by Seiji Ueda on 2021-06-12.548 UT and spectroscopically classified as a classical nova by Munari et al. 2021 (ATel #14704). We obtained a low-resolution spectrum with Monte Baldo Observatory 0.25-m Telescope + Alpy 600 spectrograph (380-800 nm, 0.497 nm/px) on 12/06/2021 and 13/06/2021, and a medium resolution spectrum with Asiago 1.22-m 'Galileo' telescope + B&C spectrograph (460-700 nm, resolution 0.25 nm) on 13/06/2021.

The first spectrum shows a blue continuum with emission lines from the Balmer series, He I and Fe II, with P-Cyg absorption profiles blue-shifted by -3200 km/s. The FWHM velocity of the Balmer lines is about 3000 km/s. Overall the spectrum is similar to the one reported by Munari et al. 2021 (ATel #14704).

Instead, the second spectrum taken the day after shows a flat continuum, the P-Cyg profiles have now weakened, with the blue-shift that has increased to -5000 km/s, as observed also by Aydi et al. 2021 (ATel #14710). All the Balmer emission lines present a flat-topped profile in both the two spectra taken on 13/06/2021, and are much broader, with the FWHM velocity that has increased to ~6000 km/s. Meanwhile, the Halpha profile seems to be more sloped, with a blue shoulder on top. The flat-topped profile can be interpreted as a signature of interaction between different ejecta being shocked, this interaction can explain the Fermi-LAT gamma-rays detection (Kwan-Lok Li 2021, ATel #14705), and can lead to the production of high-energy neutrinos (Kang et al. 2020, ApJ, 904, 4) that may be observed in the future (see Vandenbroucke 2021, ATel #14713).

The observations were performed in the framework of the ASYAGO Summer School. The two spectra taken on 13/06/2021 can be visualized at the link below.

NovaHer2021

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R. E. Rutledge, Editor-in-Chief
Derek Fox, Editor
rrutledge@astronomerstelegram.org
dfox@astronomerstelegram.org