

V1391 Cas = Nova Cas 2020

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Discovery

Nova Cas 2020 (V1391 Cas; TCP J00114297+6611190)

- Was discovered on 2020-07-27.9302 UT by S. Korotkiy and classified as a Fe II type classical nova (ATel 13903, 13919, 13939, 13941, 13967, 13998).
- The pre-discovery images by FRAM-ORM wide-field camera (Janecek et al. 2019, EPJWC 19702008) constrain the eruption date between 2020-07-26.10104 (last non-detection) and 2020-07-27.23087 (first detection; ATel 13904).
- In the following month the nova showed a series of flares (each lasting days to a week) with the brightest flare peaking at $V=10.8$ on 2020-08-10.08738 (according to FRAM and AAVSO photometry).
- Interstellar reddening is strong $E(B-V)=1.39$ mag (ATel 13905)

Instrument for photometry



C14

- Telescope Celestron Edge HD, focal reducer 0.7x, 356/3000 mm
- CCD camera MII G2-1600 + B V Rc Ic Clear filters, binning 2x2
- Scale 1.24 arcsec/px
- FOV = 13.4 x 8.9 arcmin
- Autoguiding on separate telescope
- Data acquisition - MaXimDL
- Data reduction - CoLiTecVS

Instrument for spectroscopy



C11

- Telescope Celestron CGEM 1100, focal reducer 0.66x, 280/1750 mm
- Spectrograph LISA (Shelyak Instruments)
- CCD camera ATIK-460ex, binning 1x1
- Resolution power 1000
- Autoguiding - off axis ATIK-317
- Data acquisition - MaXimDL
- Data reduction - ISIS, VisualSpec, PlotSpectra

Photometry

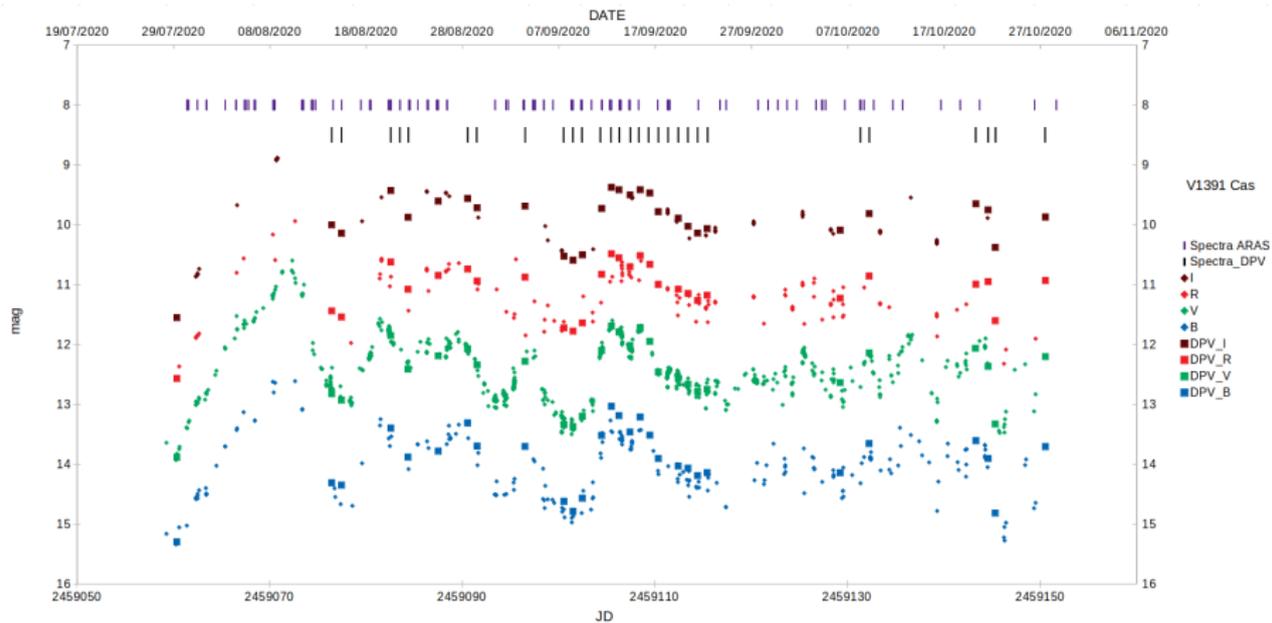


Figure: Overall light curve of V1391 Cas during the present eruption

Recent time series

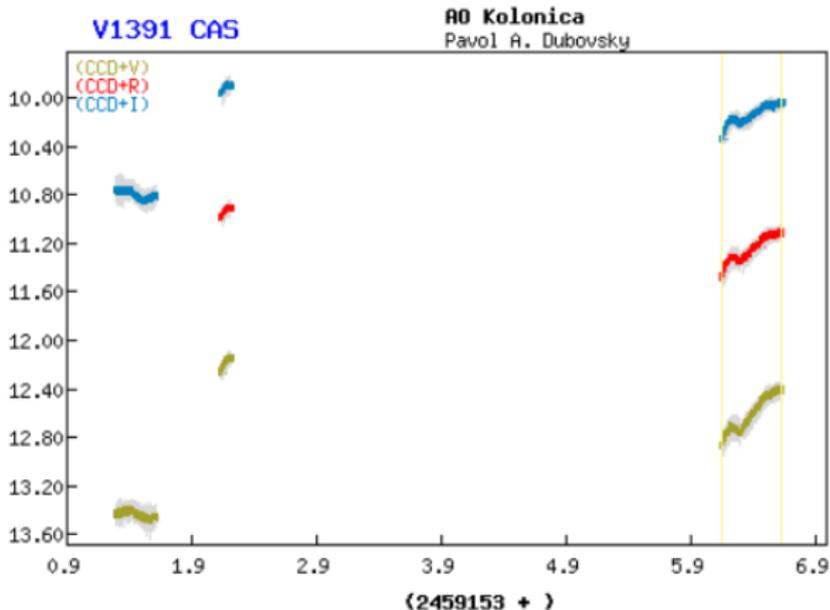


Figure: Strong variations in V filter (2020-10-31, 2020-11-01, 2020-11-05)

Spectroscopy

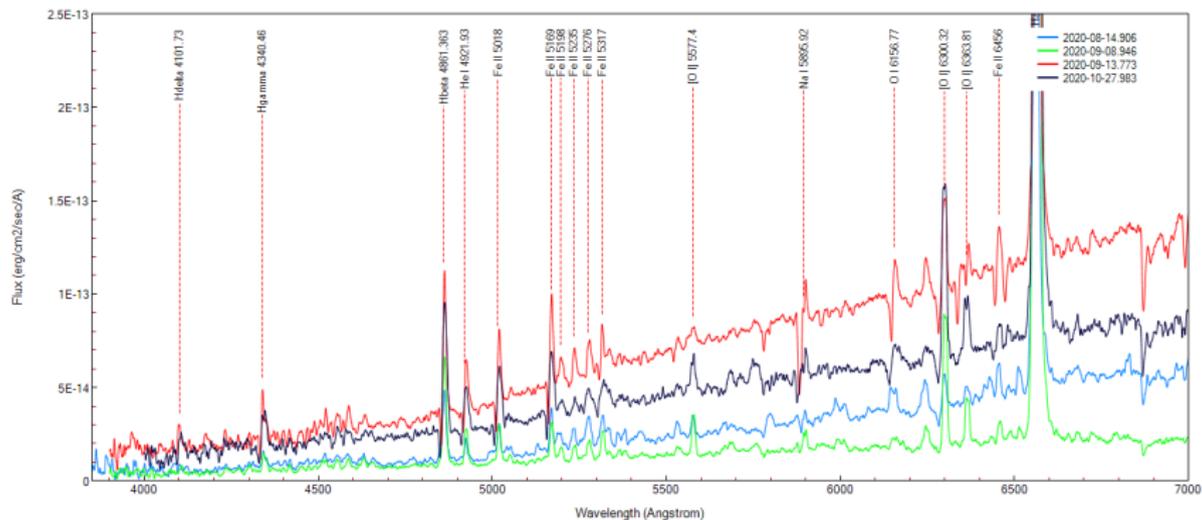
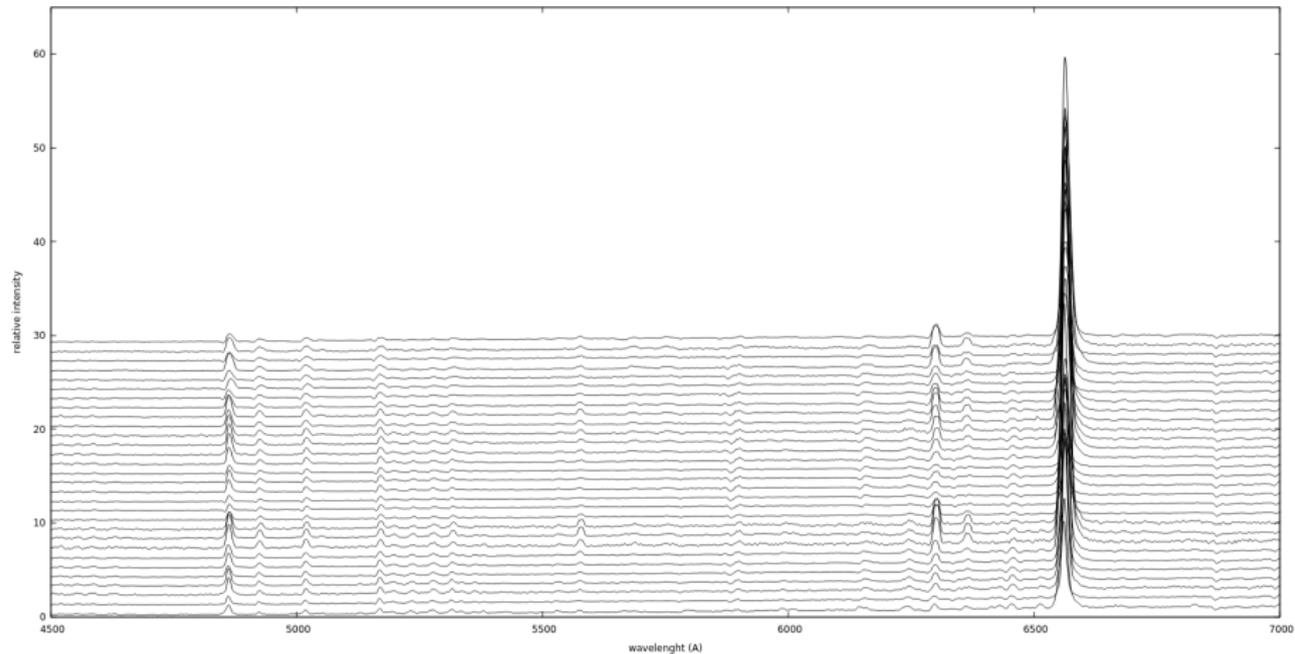
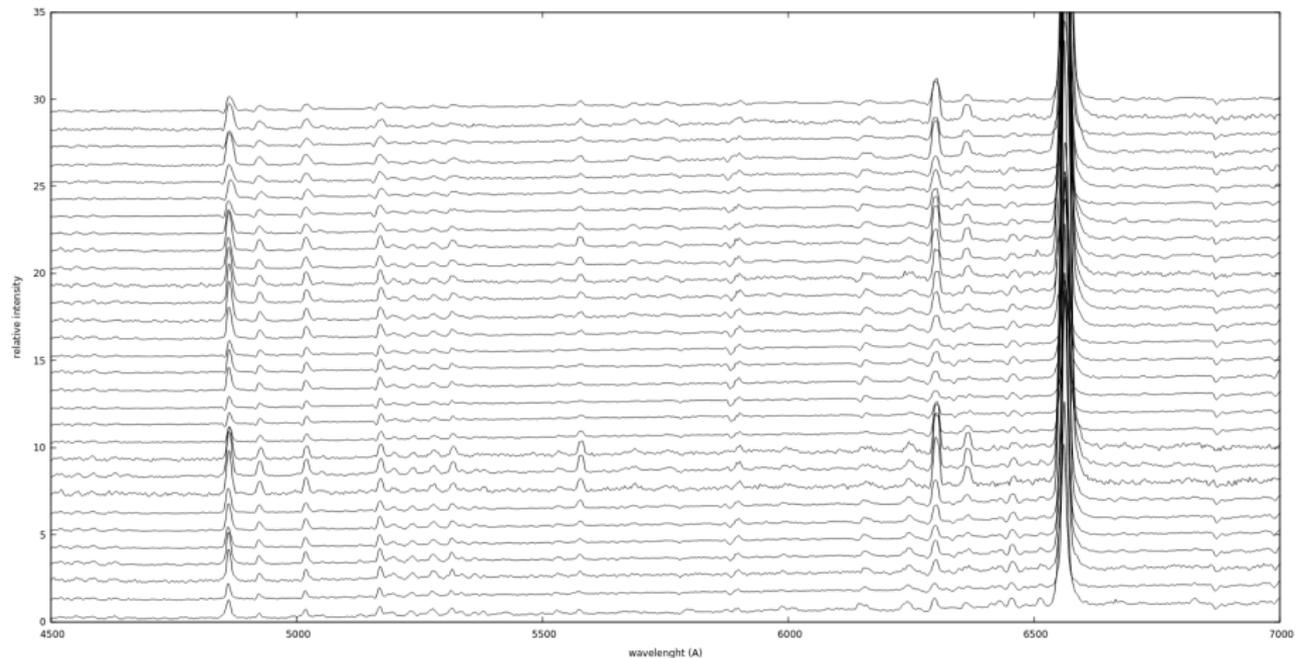


Figure: Selection of the most representative spectra

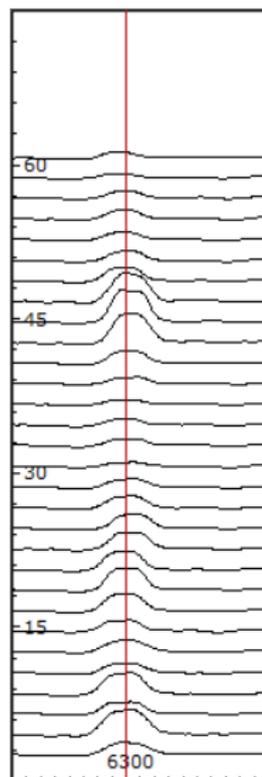
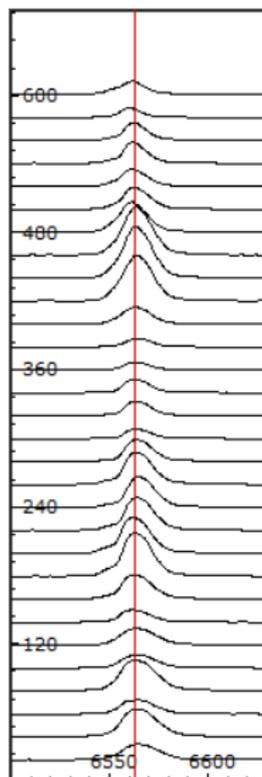
Evolution of spectral lines



Evolution of spectral lines without H α



Evolution of H α and OI 6300.32



Conclusions

The main goal of this talk is to encourage observers to pay attention to this easily observable nova

- There are still oscillations in the maximum showing rapid photometric and spectroscopic changes
- Spectra coinciding with flare peaks shows strong absorption at blueshifted velocities of 600-700 km/s
- The similar behavior is observed in other novae with multiple maxima, where the absorption lines strengthen around the peak brightness
- Such spectral evolution may be understood if the flares are associated with multiple ejections each causing the photosphere to move outwards (with a new bunch of fast-moving material) during the peak and then to recede.

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Thank you for your attention