

SN 2020jgb

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ABSTRACT

Keywords: keywords

1. INTRODUCTION

2. OBSERVATIONS

2.1. Detection and Classification

SN 2020jgb was first discovered by the Zwicky Transient Facility (ZTF; [Bellm et al. 2019](#); [Graham et al. 2019](#)) on 2020 May 03.463 UT (MJD 58972.463) with the 48-inch Samuel Oschin Telescope (P48) at Palomar Observatory. The internal designation is ZTF20aayhacx. It was detected at a magnitude of 19.86 in ZTF *g*-band, and J2000 coordinates $\alpha = 17^{\text{h}}53^{\text{m}}12^{\text{s}}.651$, $\delta = -00^{\circ}51'21''.81$. The last non-detection was on 2020 April 27.477 (MJD 58966.477; 5.99 days before the first detection) up to a limiting magnitude of 20.7 in ZTF *r*-band.

Classification, ...

2.2. Optical Photometry

We obtained *gr*-band photometry of SN 2020jgb with the ZTF camera. A Galactic extinction of $E(B - V) = 0.404$ is reported by the maps of ([Schlafly & Finkbeiner 2011](#)), for which we correct all our photometry. We do not account for any additional host extinction due to the lack of any Na I D absorption in our spectra (**Is it in the outskirts?**).

2.3. Optical Spectroscopy

2.4. Near-infrared (NIR) Spectroscopy

We obtained one NIR spectrum of the transient using the Gemini near-infrared spectrometer (GNIRS; [Elias et al. 1998](#)) on the Gemini North telescope on 2020 June 9 (≈ 22 days after *r*-band peak), for an integration time of 2400 s. The spectra were reduced with the `PyPeIt` Python package ([Prochaska et al. 2020](#); [Prochaska et al. 2020](#)).

3. ANALYSIS

3.1. Photometric Properties

- sub-luminous
- first light time, peak time
- color evolution

3.2. Spectroscopic Properties

- infrared Ca II triplet (Ca II IRT)
- tentative He I absorption at ≈ 9900 Å

3.3. Optical Spectroscopy

4. HOST GALAXY

5. MODEL COMPARISONS

6. DISCUSSION AND CONCLUSION

REFERENCES

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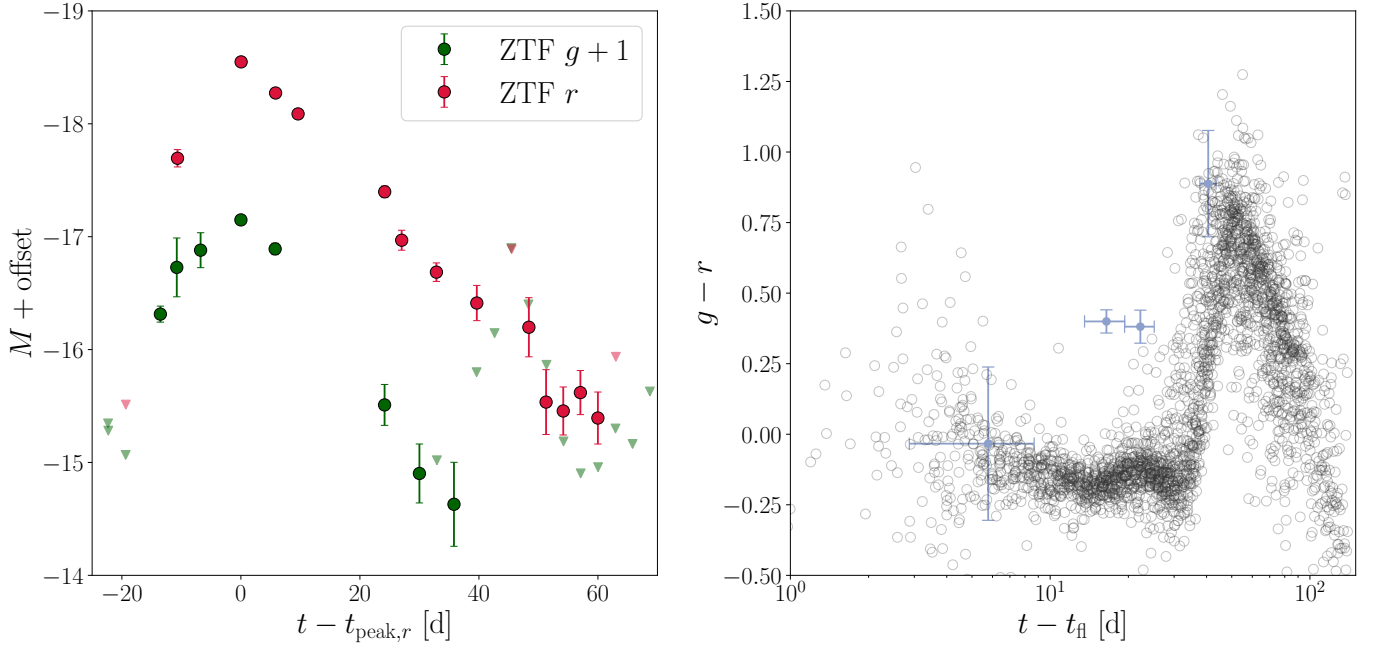


Figure 1. *Left:* multi-color (ZTF g and r bands) light curves of SN 2020jgb after extinction correction. The inverted triangles are $5\text{-}\sigma$ upper limits. *Right:* $g - r$ color evolution of SN 2020jgb (blue dots), accompanied by 62 normal SNe Ia (open circles) with prompt observations within 5 days of first light by ZTF (Bulla et al. 2020). The shaded region denotes the $1\text{-}\sigma$ credible interval of the color of SN 2020jgb, estimated using Gaussian process.

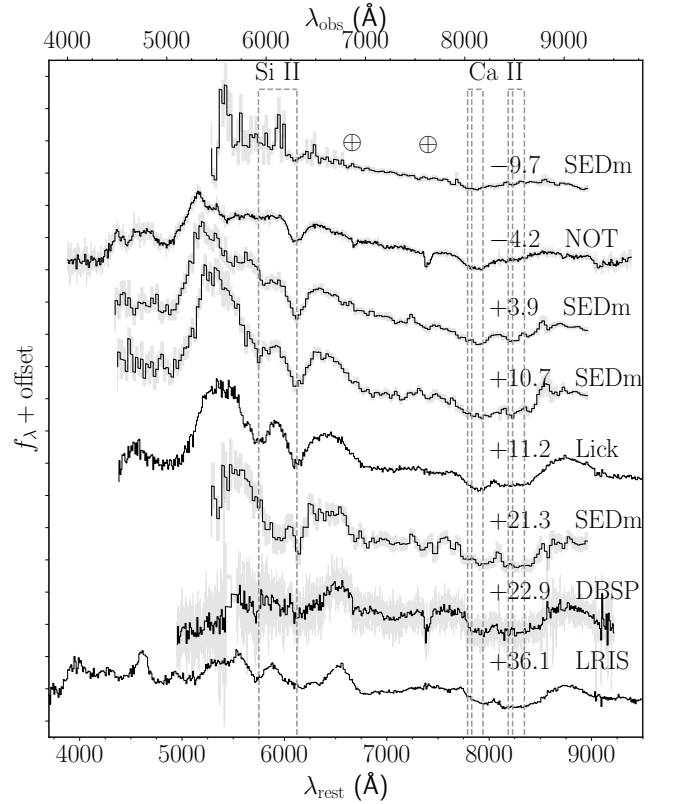


Figure 2. Optical spectroscopic sequence of SN 2020jgb.

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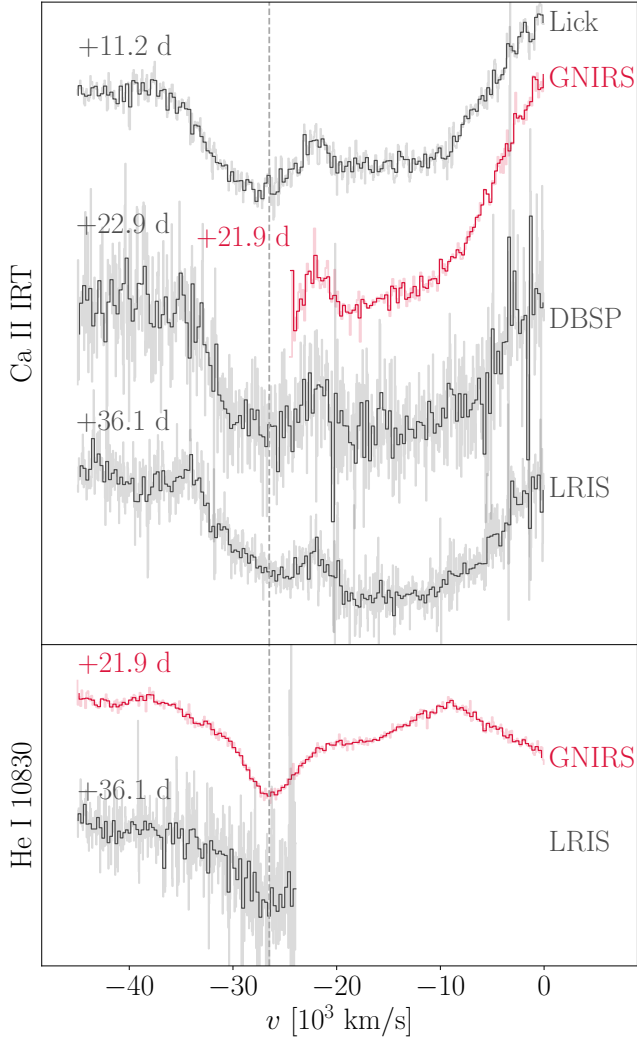


Figure 3. Line velocity comparison between the high-velocity component of Ca II IRT and the infrared absorption feature at ≈ 9900 Å assuming it is associated with He I at 10830 Å.