

Spectro-polarimetric constraints on the geometry of the ejecta in stellar merger transients

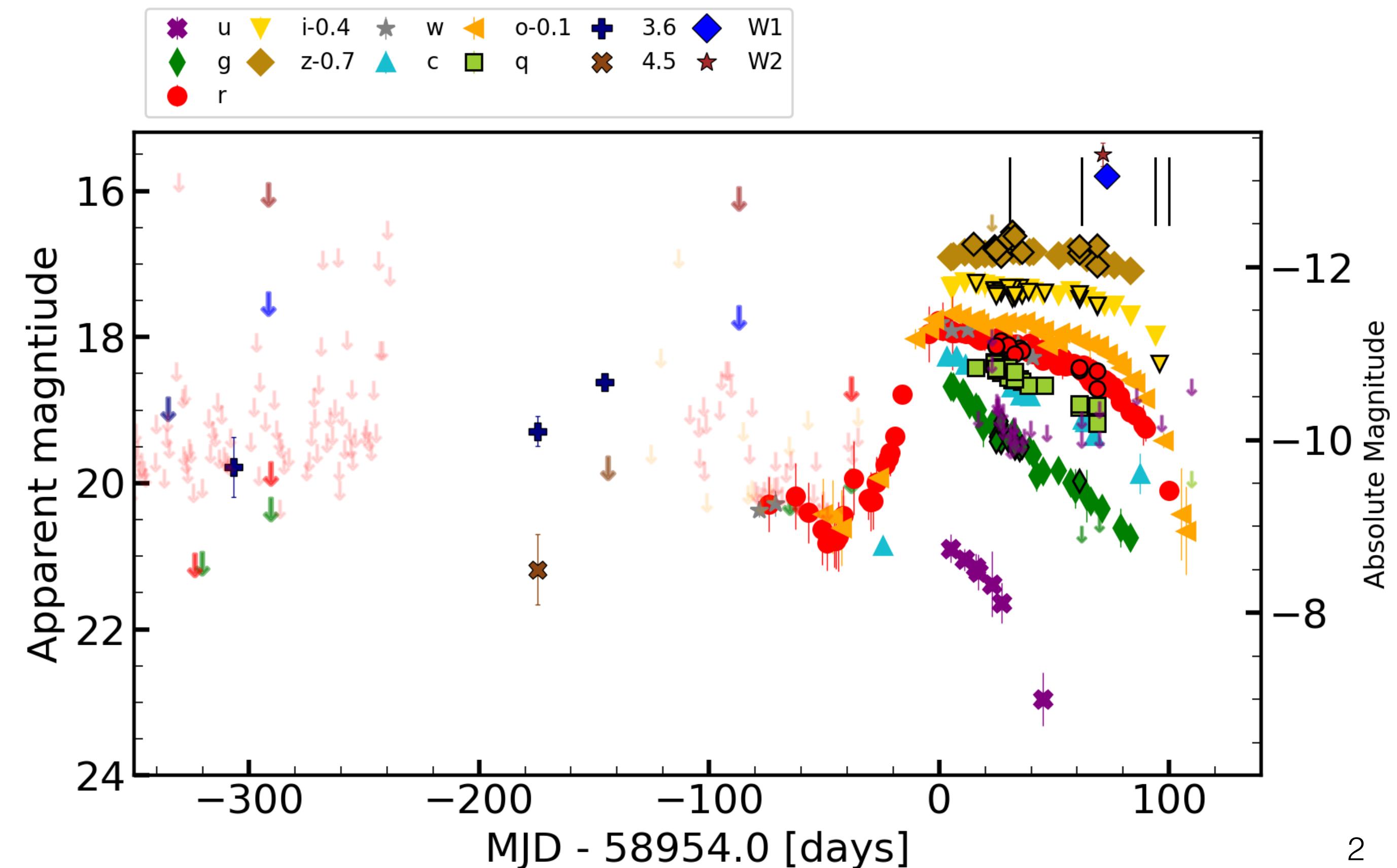
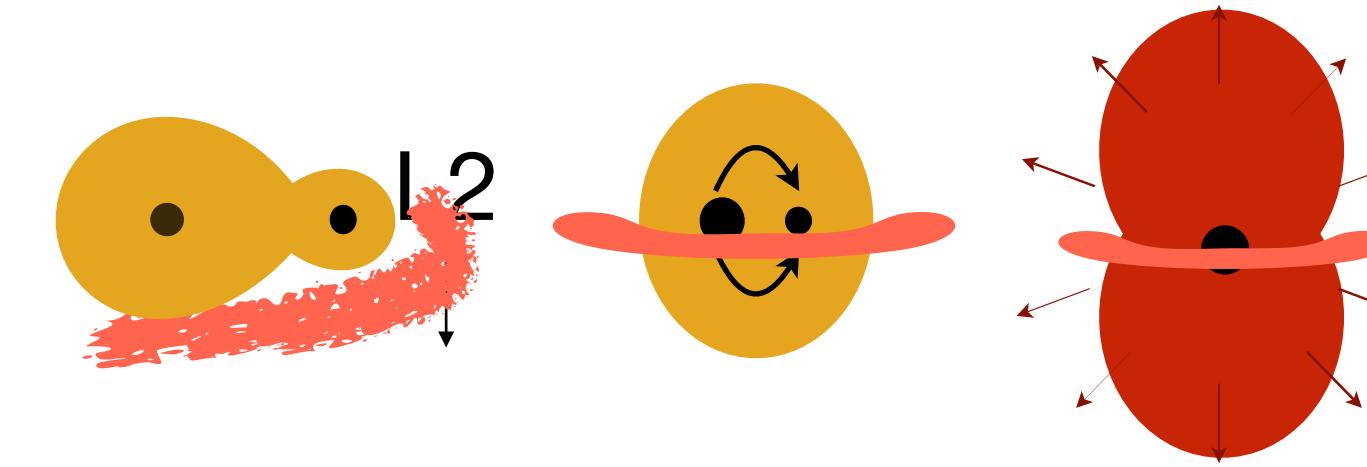
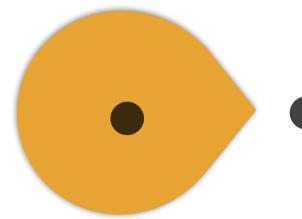
Nadejda (Nadia) Blagorodnova

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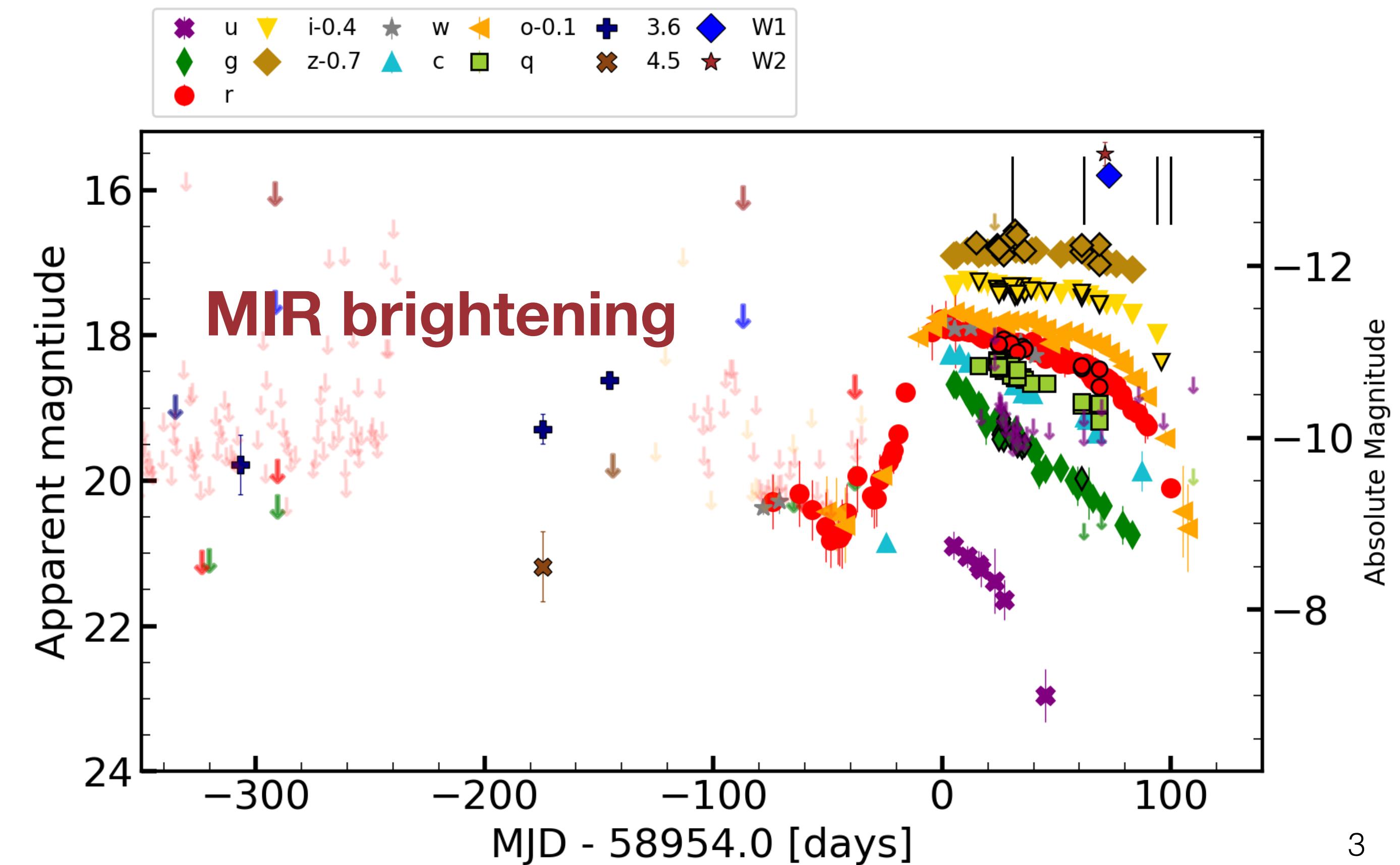
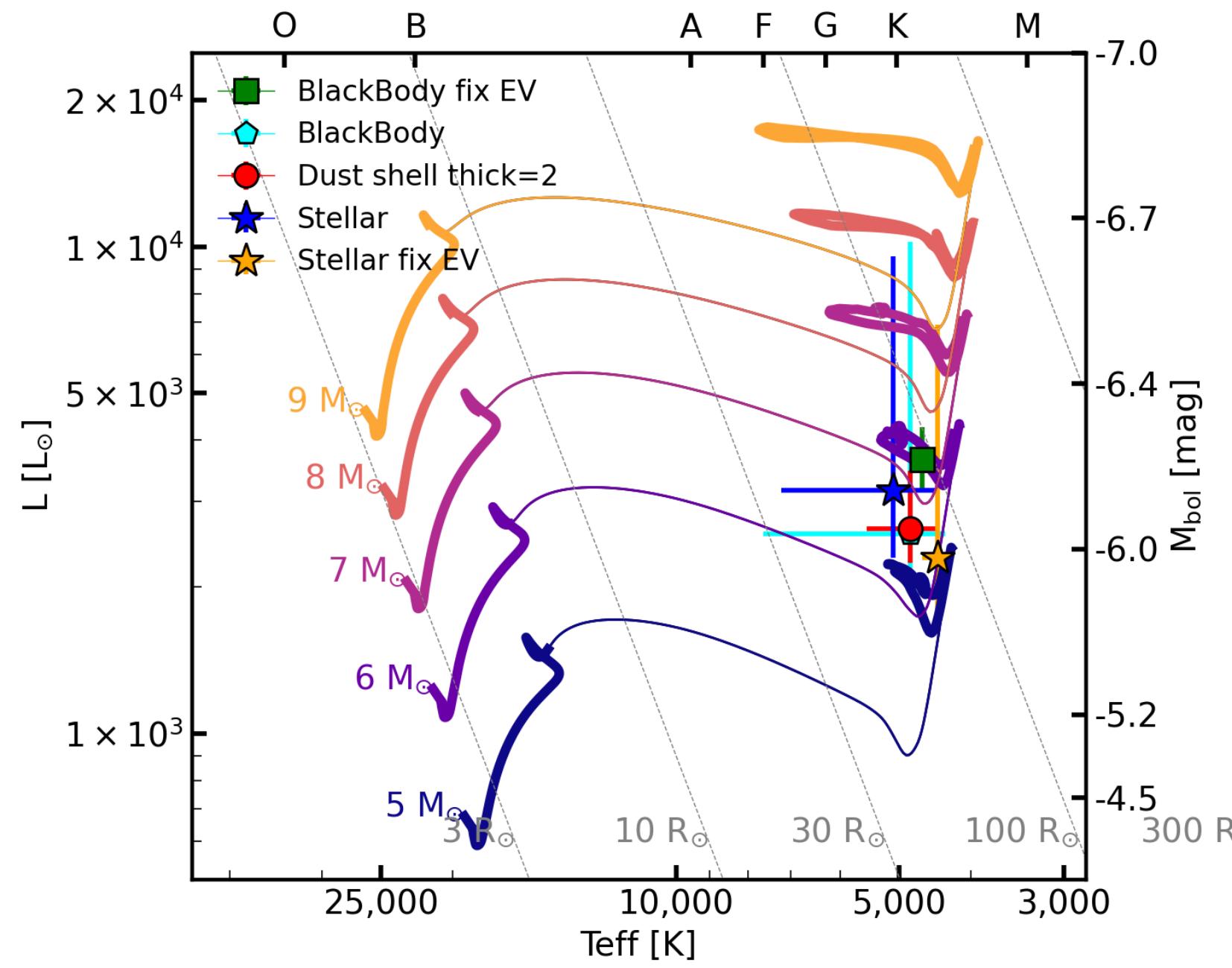
The Luminous Red Nova AT2020hat



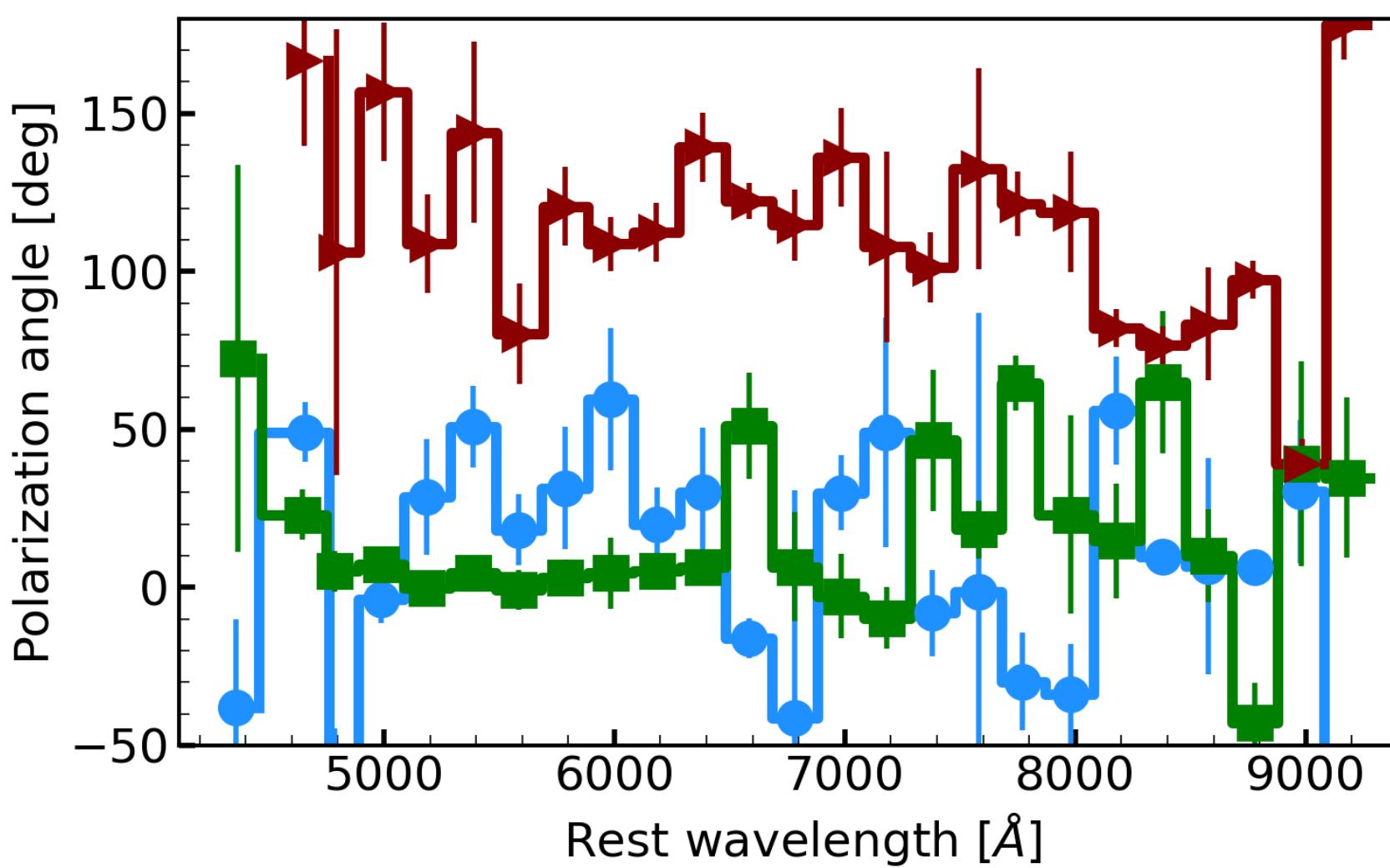
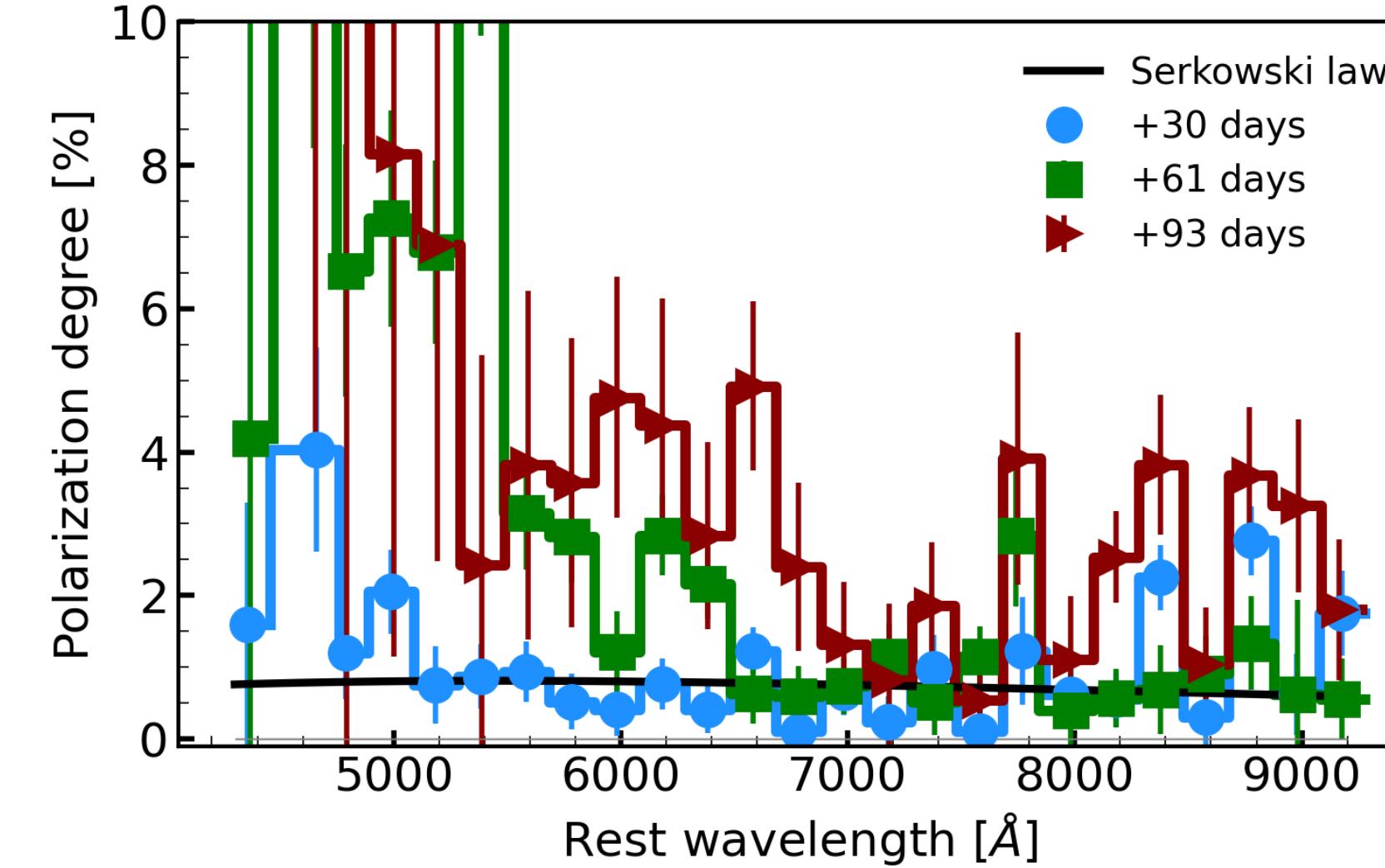
The Luminous Red Nova AT2020hat



-3 years before peak

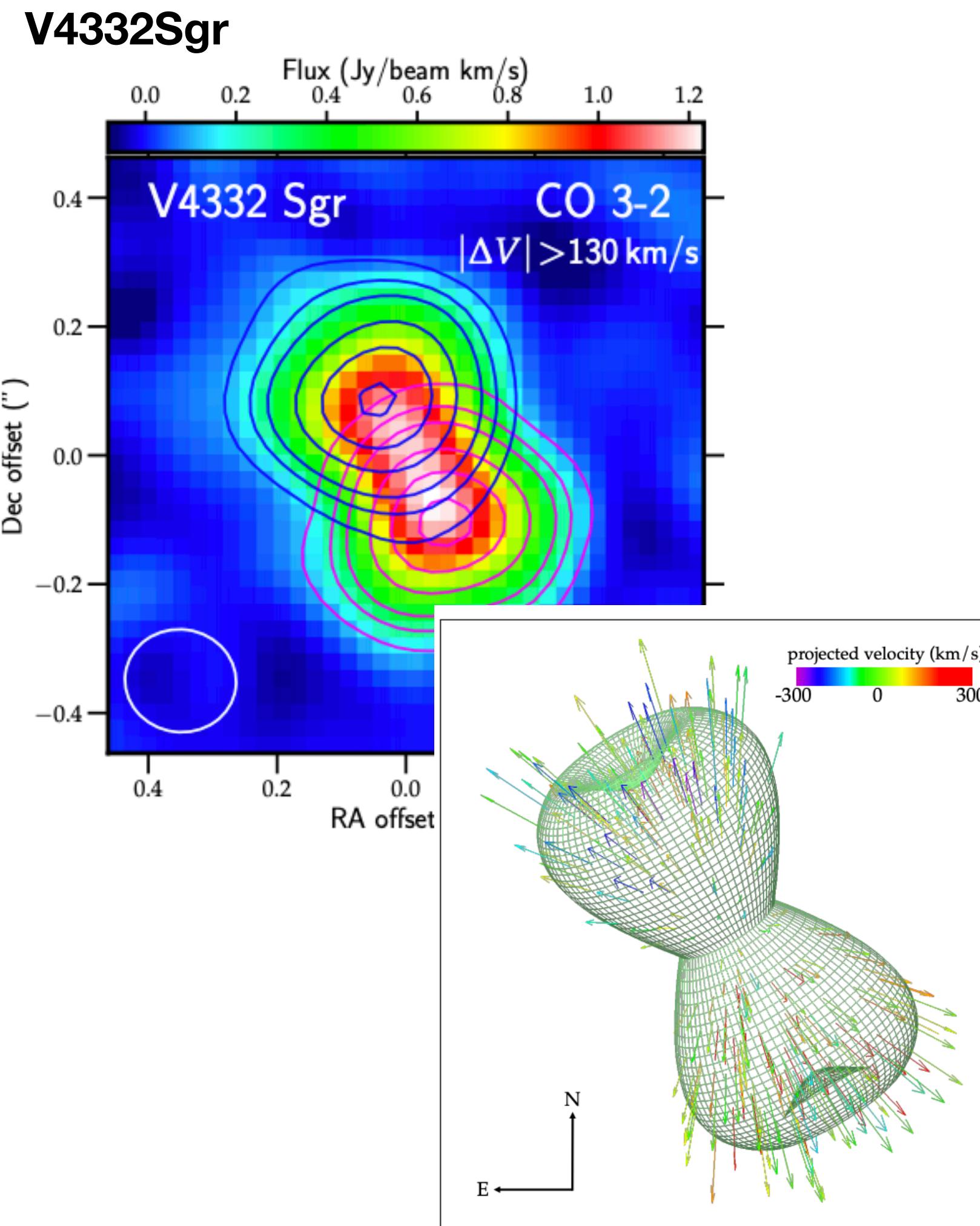


Spectro-polarimetric signal



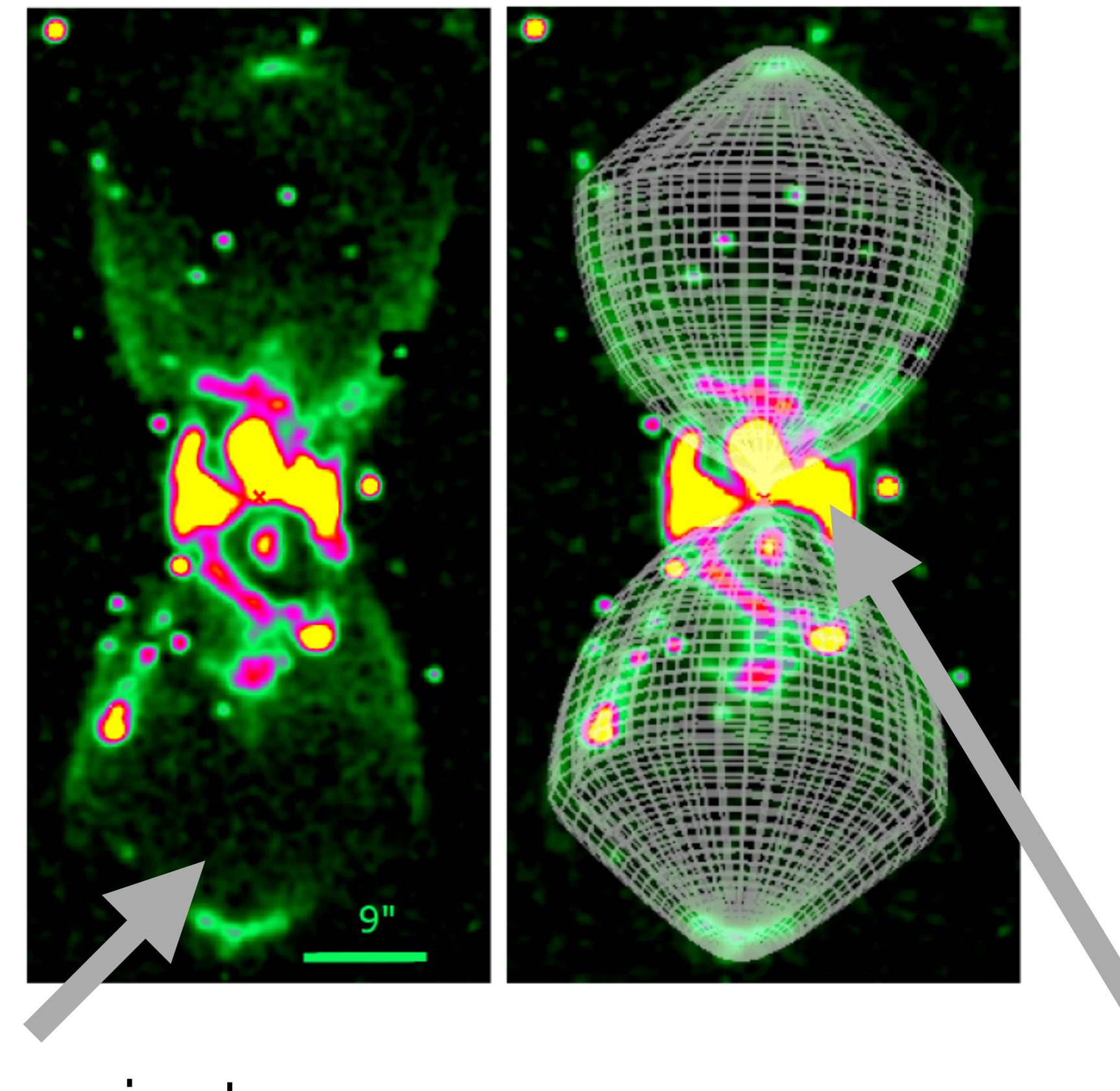
- The data were obtained with SALT/RSS.
- Maximum contribution to the polarisation signal from MW dust is $p_{\max}=0.8\%$
- The **median polarisation fraction** changes as 0.70, 1.7 and 2.6% at 30, 61, and 93 after peak.
- The median **polarisation angle** as 13.2, 10.5 and 110 deg.
- A **rotation** of 100 deg in the polarisation angle is detected in the last epoch, taken at the **end of the plateau**.
- The strong increase in polarisation (short wavelengths) and change in polarisation angle suggest that scattering by newly formed dust becomes the main contributor to the polarisation signal.

AT2020hat in the context of Galactic LRNe



Kaminski et al. 2018 , Kaminski et al. 2021ab

CK Vul
17th century LRN



Initial bipolar ejecta
dominated by e- scattering

Late time dust formation
in the ejecta dominates
the polarised signal