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NOT enables rapid transient science; case of type Ic-BL SN2020lao

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SN 2020lao is a fast Type Ic-BL SN, without an associated GRB, which was nevertheless discovered within 2.5 hours of explosion by ZTF. Fortuitously, TESS also captured its rise with a 30 minute cadence. Our follow-up comprising of optical spectra and multi-band light curves commenced within 24 hours of explosion. Due to disruption from the pandemic, we had to hop between a wide range of instruments located around the world. During this time, both spectra and photometry from the NOT were crucial in nailing down the observational sequence of SN 2020lao.

In this talk, I present the results of our extensive observational campaign which reveal that SN2020lao is one of the fastest Type Ic-BL SNe ever observed. It is also one of the youngest without a GRB trigger, providing a unique opportunity to study the early lightcurve and spectra of SNe Ic-BL unadulterated by afterglow emission. Interestingly, there is also evidence of short-lived early shock cooling emission hidden in the TESS lightcurve.

Finally, I will briefly present the Aarhus-Barcelona FLOWS photometry pipeline, which was used to calculate photometry of SN~2020lao. This open-source python code provides automatic PSF photometry of SNe, including with ALFOSC and NOTCAM at NOT.

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