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Disentangling the emission regions in blazars during flaring / transient states

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Blazars are a radio-loud subclass of AGN with relativistic jets closely aligned with our line of sight. The jet-emission in blazars is highly Doppler-boosted and non-thermal emission can be seen across the entire electromagnetic spectrum. These sources are highly variable across all timescales and display rapid flares across multiple wavelength bands. Blazar spectral energy distributions (SEDs) are characterised by a double-humped structure, indicating that the emission is dominated by two broad, non-thermal components. The lower-energy component (radio to UV/X-ray) is powered by leptonic synchrotron emission, whereas two models are proposed for the higher-energy component (X-ray to gamma-ray). The leptonic model assumes inverse-Compton scattering of photons, and the hadronic model suggests that protons produce the high- energy component via proton-synchrotron and/or photomeson processes. At optical wavelengths, there is also an underlying thermal contribution originating in the accretion disc, BLR, dust torus and host galaxy. The aim of this project is to disentangle these emission components in blazar emission during flaring and non-flaring states. This will be done using optical spectropolarimetry to separate the thermal non-polarised and non-thermal polarised components. The observations form part of two SALT observing programmes that study the evolution of the linear polarisation in blazars. This will be coupled with photometric data from the LCO telescope network to improve flux calibration and study optical light curves. We present spectropolarimetry and photometry results on a selection of such blazars.

Abstract field

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