

Celebrating 20 years of Swift Discoveries



Contribution ID: 169

Type: **Poster**

The UVOT Image Subtraction Pipeline

Tuesday 25 March 2025 14:08 (1 minute)

The detection of faint optical transients is a critical component of gravitational wave (GW) follow-up efforts. Compact object mergers (e.g., binary neutron stars) produce kilonovae – thermal transients powered by the radioactive decay of r-process elements. Unlike GRB jets, kilonovae are comparatively isotropic and thus may offer a higher likelihood of detection. However, their faintness and location within host galaxies make their detection challenging, as galactic diffuse emission can obscure the transient signal. To address this, we present a new pipeline for automated image subtraction of UVOT GW follow-up data. By utilizing high-quality template images, the pipeline effectively removes the galactic background, enabling the detection of faint transients embedded within host galaxies. We will describe the methodology and demonstrate the pipeline's performance on simulated and real UVOT observations, and discuss its potential in finding electromagnetic counterparts to GW events, as well as other ultraviolet transients such as supernova shock breakouts, tidal disruption events, and stellar flares.

Primary authors: Dr KORDE-PATEL, Asmita (NASA-GSFC); Dr MARSHALL, Frank (NASA-GSFC); KLINGLER, Noel (NASA-GSFC / UMBC / CRESST II)

Presenter: KLINGLER, Noel (NASA-GSFC / UMBC / CRESST II)

Session Classification: Poster Session