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New tools for improved UVOT photometry

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The Swift UVOT plays a crucial role in time-domain astronomy, but light curves, especially in the UV, are plagued with "dropouts," outliers with photometric fluxes that are up to 30% lower than surrounding points. These dropouts are caused by localized sensitivity variations in the detector. We have developed algorithms that map out the detector plane and flag these points, producing more reliable photometry at the cost of losing 10-20% of the data. We will demonstrate this process with the AGN in which this problem and solution was first discovered, NGC 5548.

The next step will be to flux correct instead of censoring these data, using more detailed detector sensitivity maps based on millions of measurements in archival data. We are also developing tools to recover the UVOT data affected by the 2023-24 pointing stability anomaly. Our goal is to improve the availability and usefulness of existing UVOT data and the reliability of future observations. This talk will give a preview of these tools and describe the status of their development.

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