

動きの速いものを見る方法： 過渡イベント周波数による高忠実度の イベント放射輝度回復

NII

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Key Idea

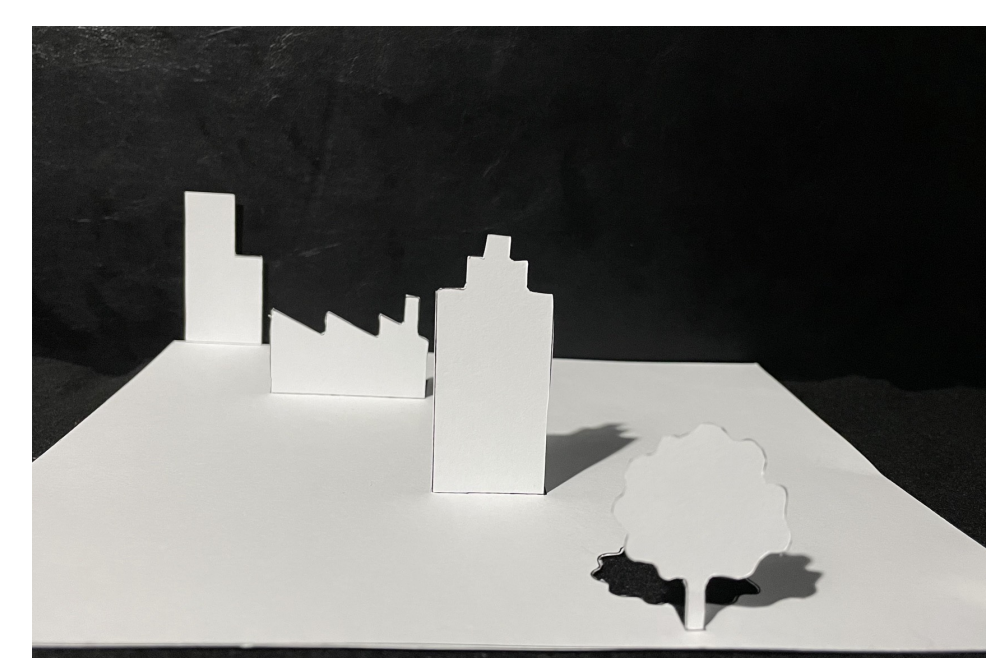
We propose to use event cameras with bio-inspired silicon sensors, which are sensitive to radiance changes, to recover precise radiance values. We reveal that, under active lighting conditions, the transient frequency of event signals (TEF) triggering linearly reflects the radiance value. We propose an innovative method to convert the high temporal resolution of event signals into precise radiance values. The precise radiance values yields several capabilities in image analysis.

Experimental Results

Integration (baseline)



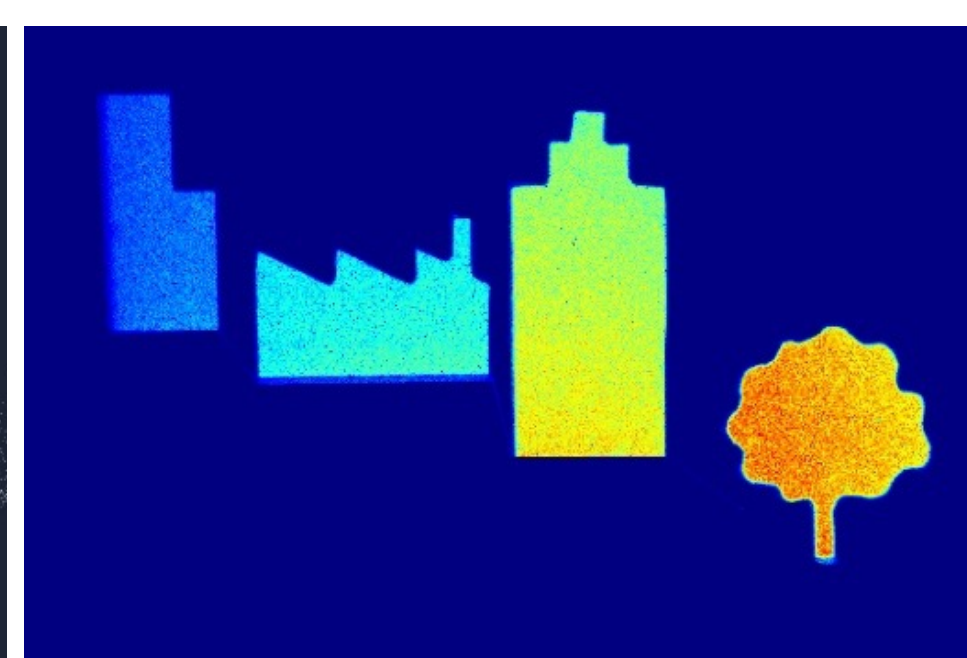
Frequency (ours)



Target object



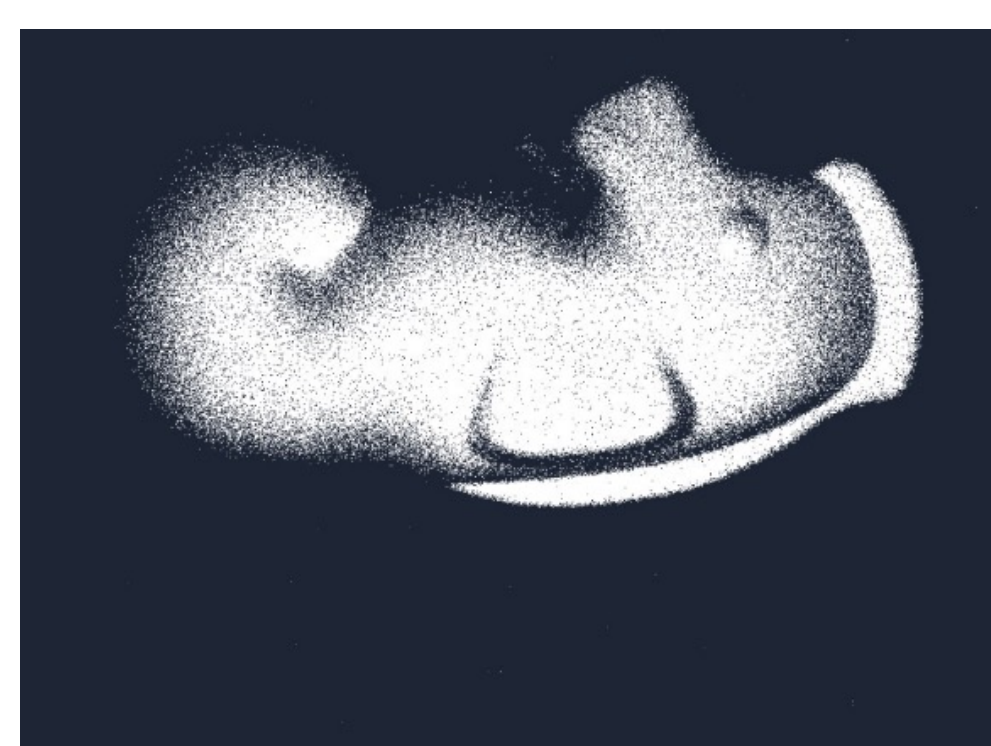
Event signals



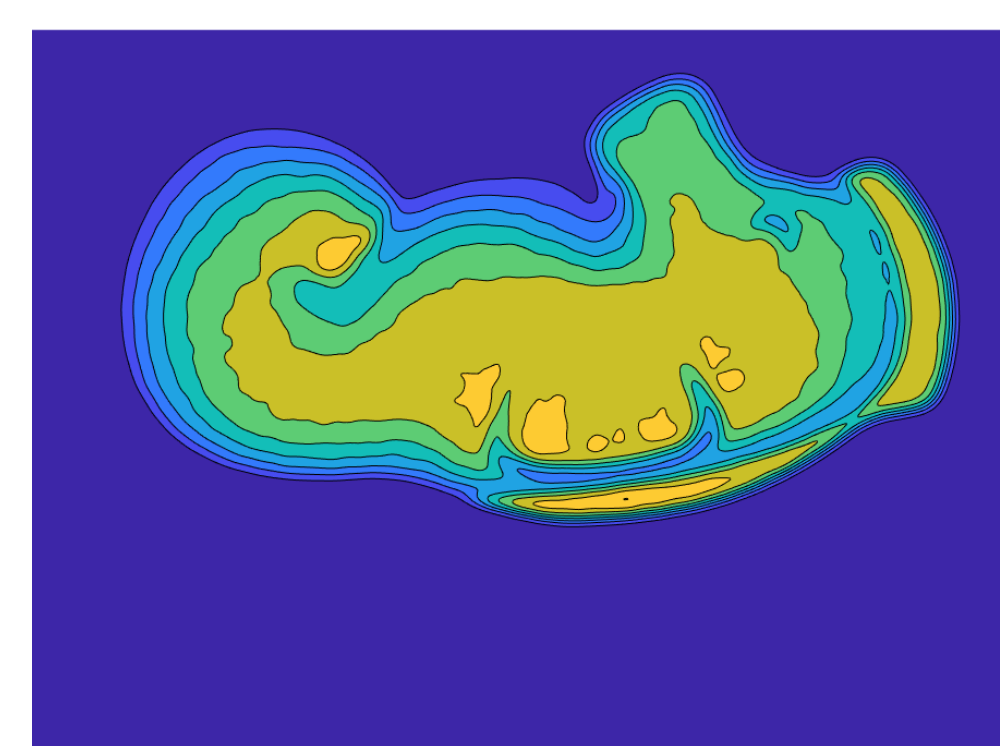
Depth map



Target object

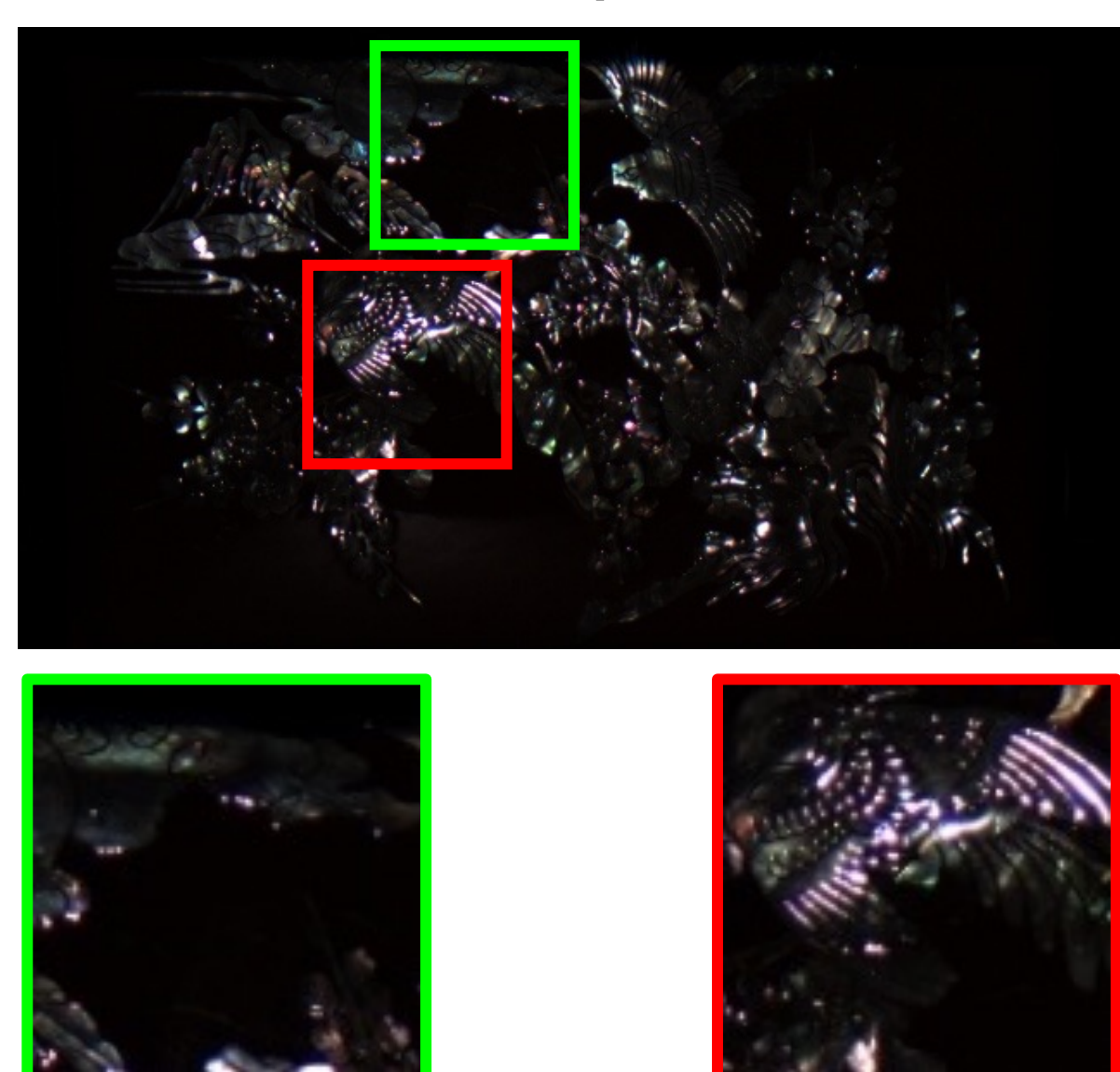


Event signals



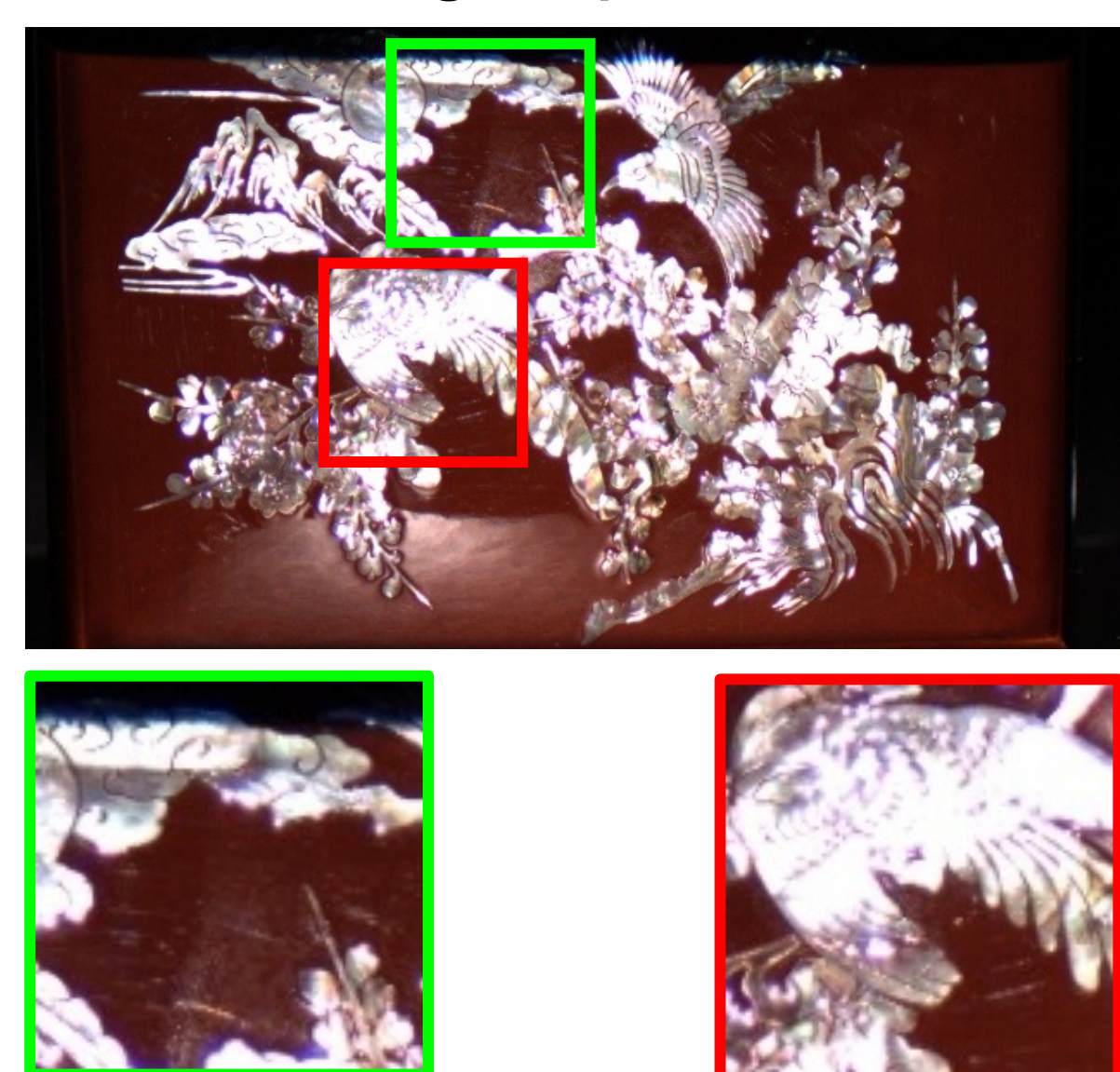
Iso-depth contour map

Short exposure

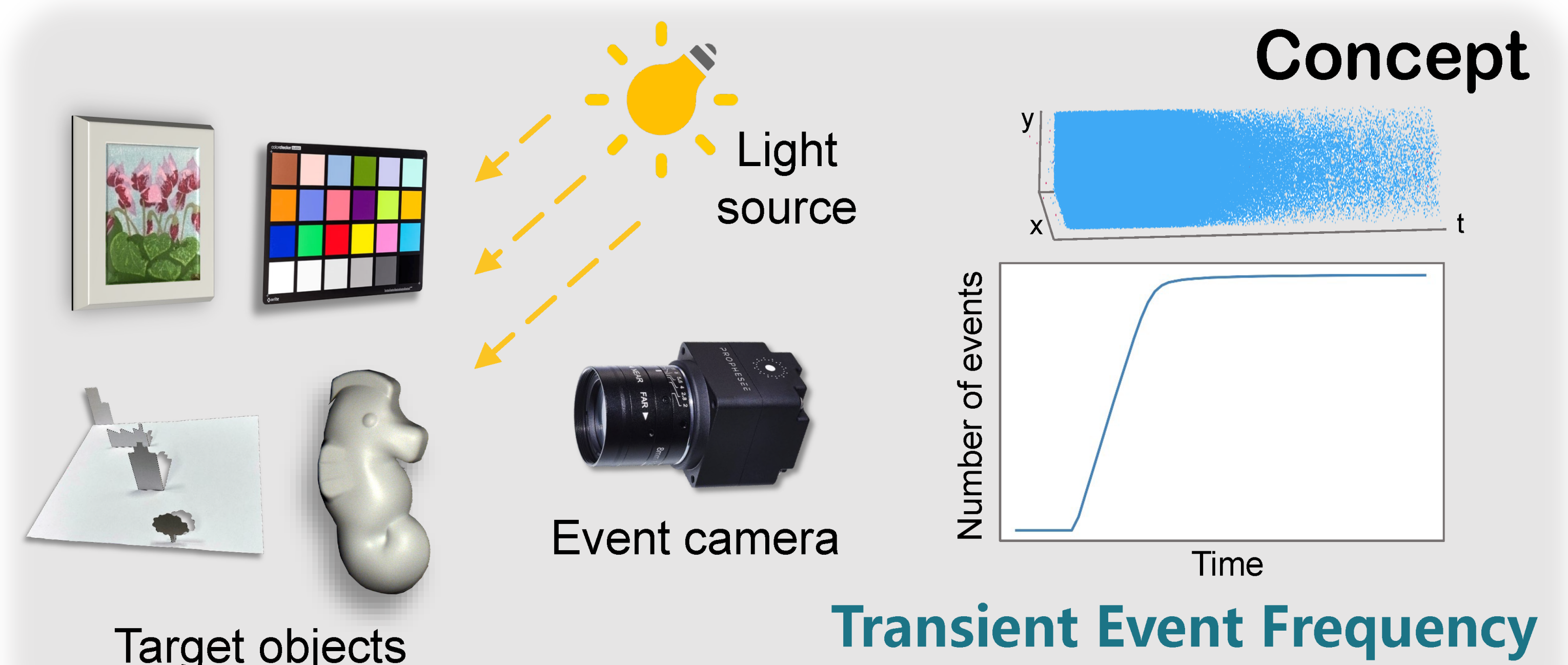
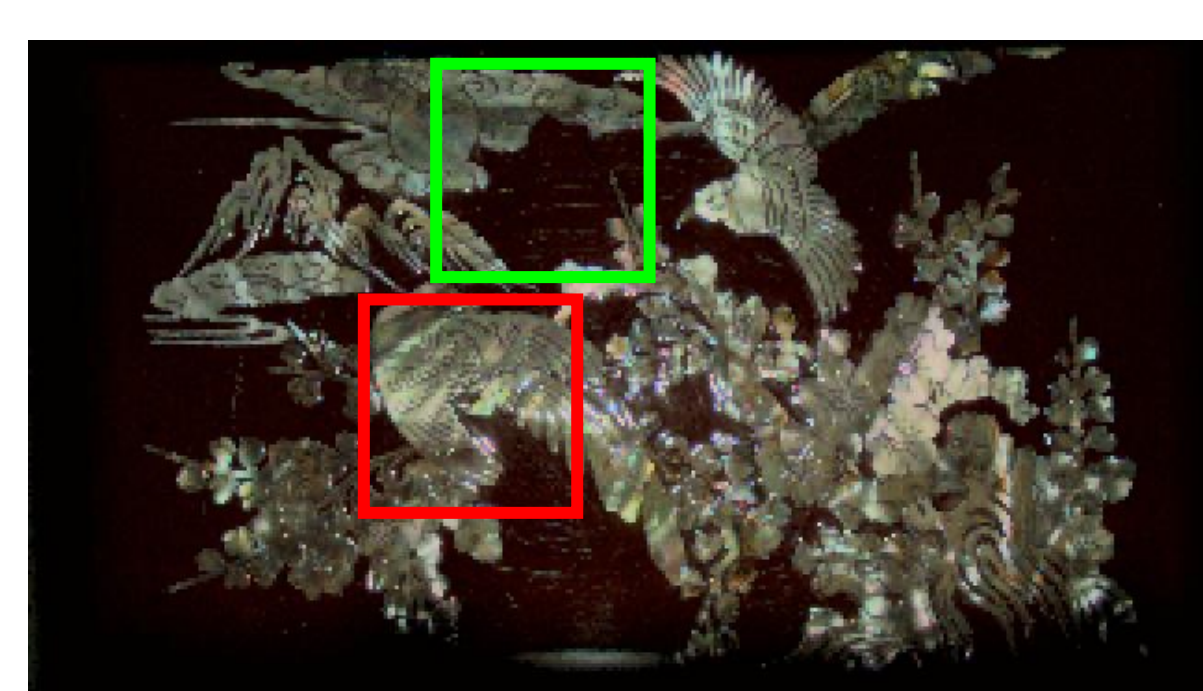


Conventional camera

Long exposure

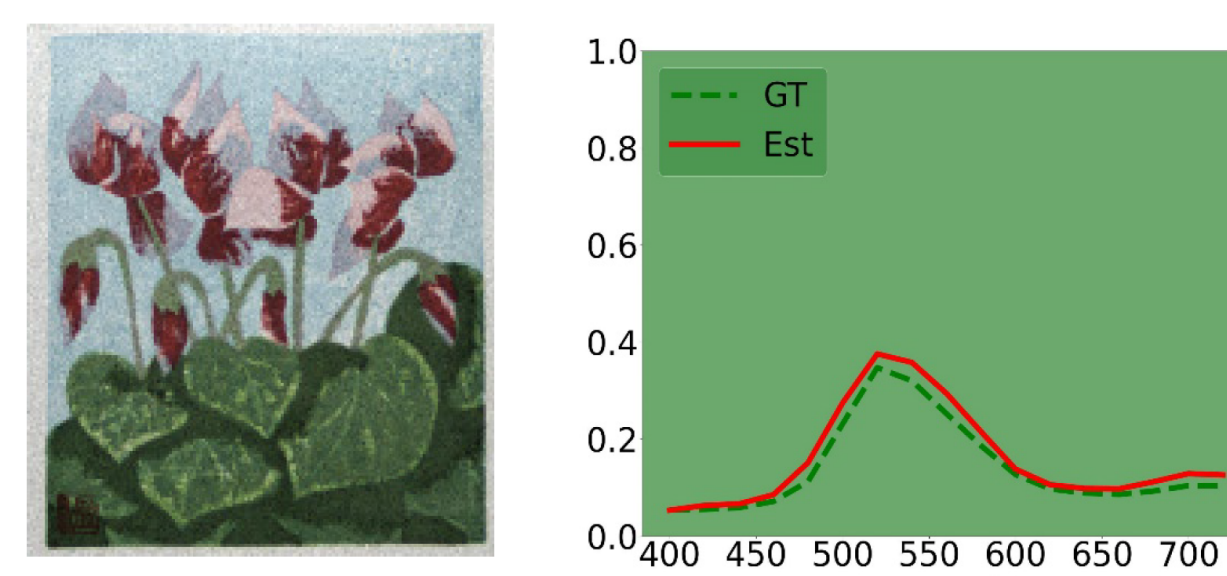


Event camera

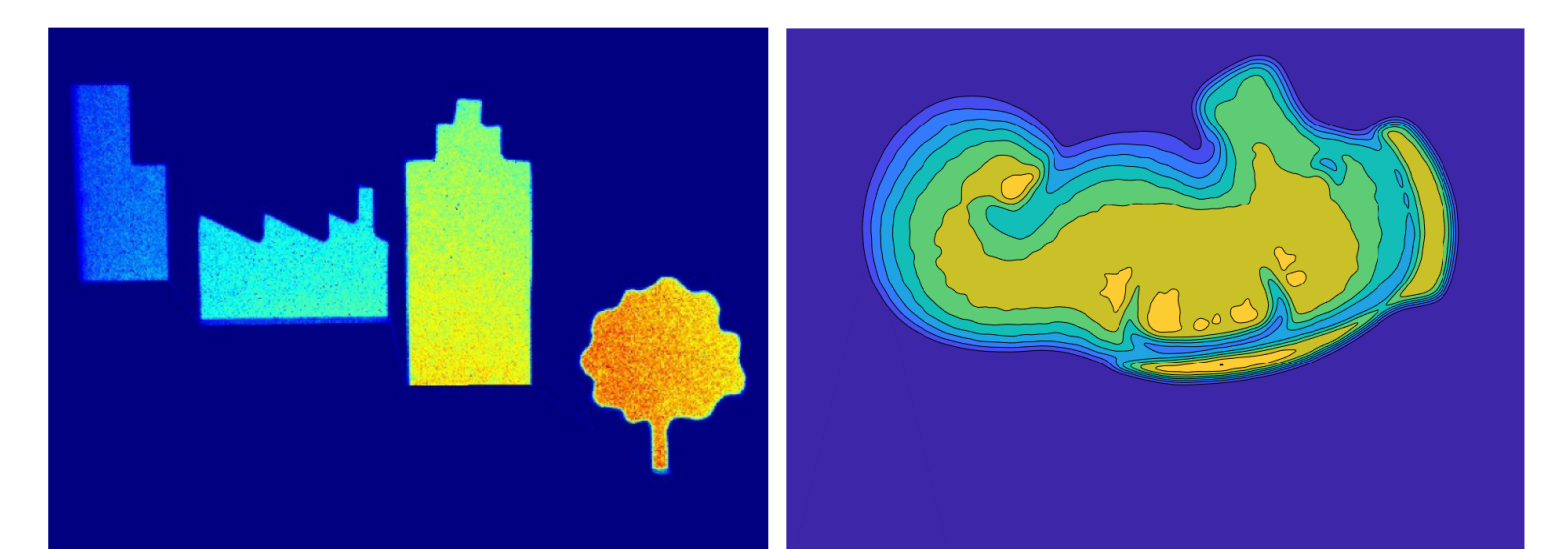


Capabilities

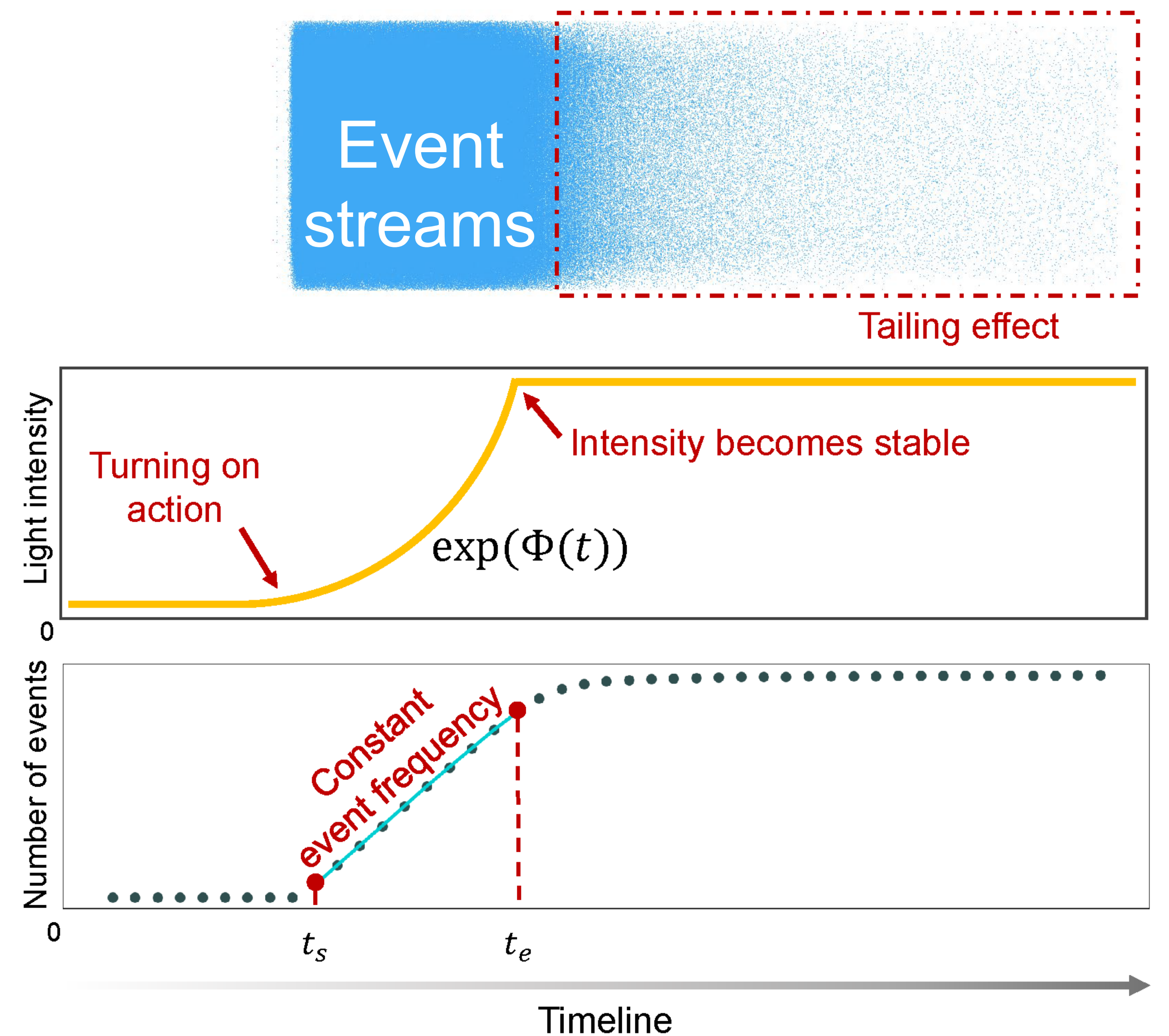
Broadband spectroscopic



Precise stereoscopic

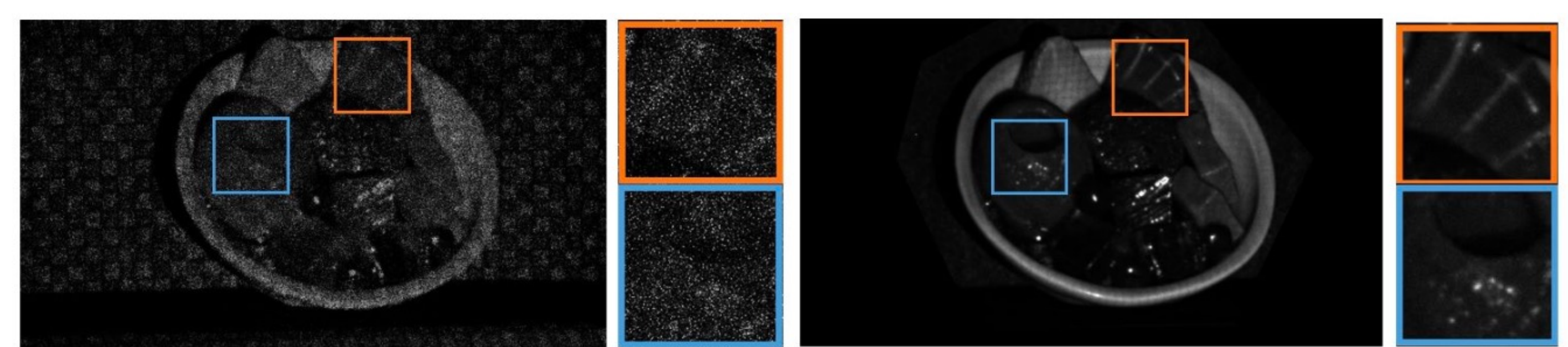


Key Observation

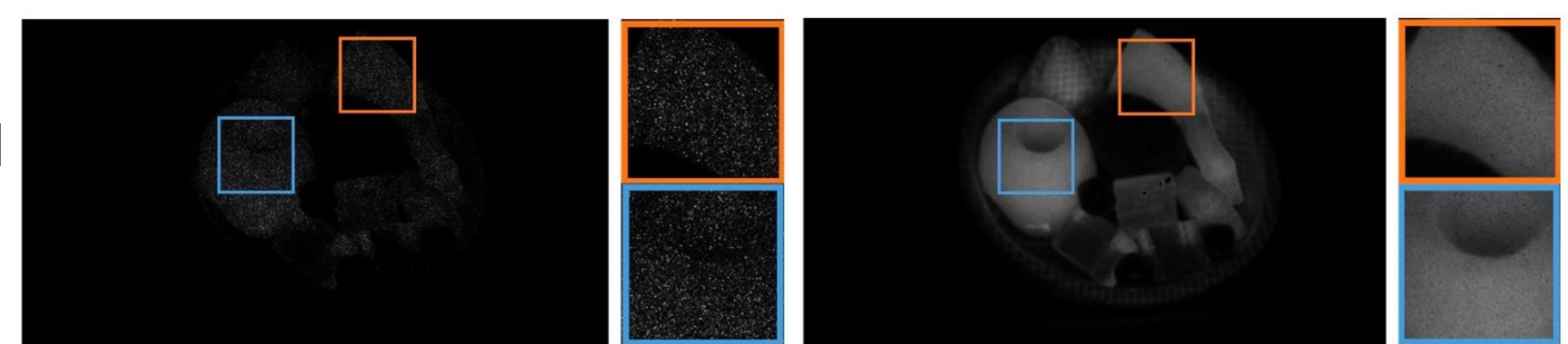


We reveal the **linear** relationship between TEF and radiance values at the split second of turning light on.

Direct image



Global image



Integration (baseline)

Frequency (ours)