

EGU24-18534, updated on 19 Mar 2025

<https://doi.org/10.5194/egusphere-egu24-18534>

EGU General Assembly 2024

© Author(s) 2025. This work is distributed under the Creative Commons Attribution 4.0 License.



## Visualizing three years of STIX X-ray flare observations using self-supervised learning

**Mariia Drozdova**, Vitaliy Kinakh, Francesco Ramunno, Erica Lastufka, and Slava Voloshynovskiy  
University of Geneva, Computer Science, Geneva, Switzerland (mariia.drozdova@unige.ch)

Operating continuously for over three years, Solar Orbiter's STIX has observed more than 43 thousand X-ray flares. This study presents a compelling visualization of this publicly available database, using self-supervised learning to organize reconstructed flare images by their visual properties. Networks designed for self-supervised learning, such as Masked Siamese Networks or Autoencoders, are able to learn latent space embeddings which encode core characteristics of the data. We investigate the effectiveness of various pre-trained vision models, fine-tuning strategies, and image preparation. This visual representation offers a valuable starting point for identifying interesting events and grouping flares based on shared morphological characteristics, useful for conducting statistical studies or finding unique flares in this rich set of observations.