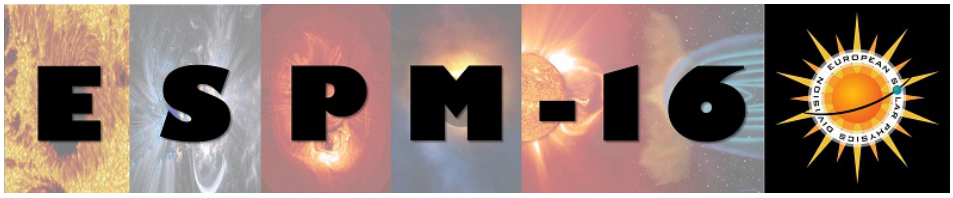

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Multi-instrument STIX microflare study

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Solar flares are generally thought to be the impulsive release of magnetic energy giving rise to a wide range of solar phenomena that influence the heliosphere and in some cases even conditions on Earth. Part of this liberated energy is used for particle acceleration and to heat up the solar plasma. The Spectrometer/Telescope for Imaging X-rays (STIX) instrument onboard the Solar Orbiter mission promises considerable advances in the understanding of electron acceleration and plasma heating. It observes X-rays in the energy range from 4 to 150 keV, enabling it to diagnose thermal plasma with temperatures of ⪆ 10 MK, as well as nonthermal bremsstrahlung emission of flare accelerated electrons. During the spacecraft commissioning phase in 2020, STIX observed 68 microflares, all of which originated in an active region that was also visible from Earth. These events provided a great opportunity to demonstrate the great potential in combining the STIX observations with multi-band EUV imagery from the Atmospheric Imaging Assembly (AIA) instrument on board the Earth orbiting Solar Dynamics Observatory.
We show first results from two GOES B-class events for which we combined STIX spectroscopic analysis with plasma diagnostics through differential emission measure analysis performed on AIA observations to analyze thermal flare plasma outside STIX's sensitivity. We find that the thermal parameters inferred from STIX and AIA differ due to the different temperature ranges covered by each instrument. The values deduced from STIX are consistent with similar sized flares in the literature. We conclude that STIX spectroscopy is science ready.

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