The Spectrometer Telescope for Imaging X-rays (STIX) on-board Solar Orbiter

— for the STIX Collaboration and the STIX Science Team —

**STIX Science**

**STIX measures**
- intensity
- spectrum
- timing
- location

of hard X-rays caused by bremsstrahlung of thermal and non-thermal electrons in the corona.

**Main parameters**
- Energy range: 4 - 150 keV
- Energy resolution: 1 - 15 keV (energy dependent)
- Fourier components: 30
- Effective area: 6 cm²
- Angular resolution: 7 arcsec
- Pointing accuracy: 4 arcsec
- Field of view: 2°
- Time resolution: 0.1 s (statistics limited)

**STIX Science Goals:**
1. STIX will link high-energy electrons observed in situ to their coronal origin and study their transport into interplanetary space.
2. Such incidences will determine the magnetic connectivity of the spacecraft to the corona. This is essential information for solar wind instruments.
3. Due to proximity and low background STIX will be more sensitive than previous instruments and will observe many microflares, smaller in hard X-rays than ever.
4. STIX will observe coronal X-ray sources supposed to be related to flare energy release and particle acceleration. Jointly with other imaging instruments it will investigate these processes.
5. Jointly with in situ instruments, STIX will determine the origin of delayed Type III/SEP events.
6. In conjunction with other X-ray spectrometers, STIX will determine the directivity of the X-ray emission and differently occulted events for the first time in X-rays.

**STIX Technology**

**Method:**
Indirect Fourier imaging similar to HXT (Yohkoh) and RHESSI

New:
1. Pixelization of the sensor allows to double the number of Fourier components greatly improving image quality
   - For each subcollimator, the slightly different pitch and orientation of the front and rear grids create a Moiré pattern. Amplitude and phase yield real an imaginary part of one Fourier component.
2. Caliste-SO hybrid using 32 CdTe sensors operating at -20 C
3. Modular and lightweight technology easy to reproduce for future instruments allowing stereoscopic observations

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