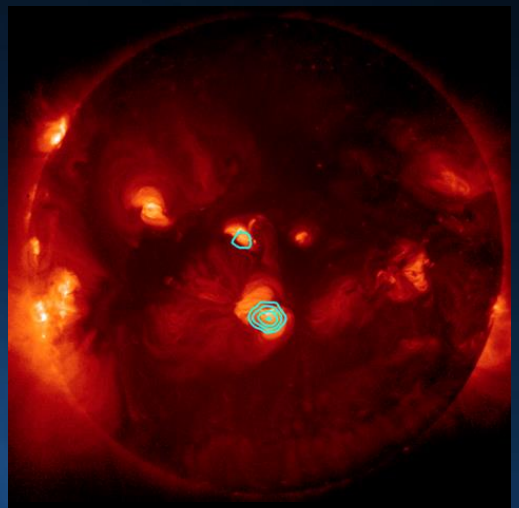
FOXSI-2 Sounding Rocket Instrument Spots Signatures of Nanoflares



FOXSI's observations of hard X-rays are shown in blue, superimposed over a soft X-ray image of the Sun from the Hinode mission. Credit: JAXA/NASA/Hinode/FOXSI

The second flight of the FOXSI instrument – short for Focusing Optics X-ray Solar Imager – lasted 15 minutes and collected six minutes of difficult-to-obtain solar data on hard X-rays (HXR). The data show the best evidence to date of how tiny solar flares, called **nanoflares**, contribute to the extreme heating of the solar corona, which is mysteriously 300 times the temperature of the solar surface.

A paper on the FOXSI 2 data was published by an international team of scientists which was led by ***Shin-nosuke Ishikawa*** of the *Japanese Aerospace Exploration Agency (JAXA).*

Nanoflares produce superheated pockets of plasma that reach around 10 million degrees Celsius. Plasma at these temperatures emit light in hard X-rays, which are notoriously difficult to detect.

FOXSI-2 used a new technique called **direct focusing** which allowed detectors to track where HXRs were originating on the Sun.

Analysis of data from FOXSI-2 and the JAXA/NASA Heliophysics Hinode mission show that hard X-rays, which are known mostly to come from large solar flares, were present in areas where no large solar fares had recently occurred. The team suggests nanoflares are the likely instigator of the HXRs detected in the data. The production of these pockets of super heated plasma that result in HXRs may be one way the solar corona is heated to such high temperatures.

FOXSI is a collaboration between NASA and JAXA. FOXSI-2 launched from the White Sands Missile Range in New Mexico on December 11, 2014. FOXSI-3 is set to launch on another sounding rocket in the summer of 2018.

New hardware is being installed on the third flight to eliminate much of the background noise from the instrument, allowing for more precise measurements. FOXSI is supported through NASA's Sounding Rocket Program at the Goddard Space Flight Center's Wallops Flight Facility in Virginia.

NASA's Heliophysics Division manages the Sounding Rocket Program for NASA.