Interface Region Imaging Spectrograph First Results

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IRIS provides novel views of the mass cycle at the interface between the cool surface and hot atmosphere.
Strong Dopplershifts from IRIS spectra reveal multitude of violent events

S Mg II h/k spectra
15,000 K

IRIS Si IV spectra
65,000 K

IRIS Slit-jaw Image Si IV sensitive to plasma of 65,000 K
IRIS images and spectra reveal a bewildering complexity of turbulent motions in solar prominences.

IRIS Slit-jaw Image Si IV 1400

IRIS Si IV spectra sensitive to plasma of 65,000 K

IRIS Mg II h/k spectra 15,000 K
The complex motions and cooling/heating patterns provide a significant challenge to theoretical models.

IRIS Mg II h/k spectra 15,000 K

IRIS Slit-jaw Image Si IV 1400 sensitive to plasma of 65,000 K
Coordinated observations with other spacecraft (Hinode and SDO) help reveal the thermal evolution of spicules.
IRIS spectra and images reveal high velocities and rapid heating.

IRIS Mg II h/k spectra 
15,000 K

IRIS Slit-jaw Image Si IV 1400 
sensitive to plasma of 65,000 K
Strong transverse motions are common in spicules.

Mg II k

279.524 nm

$-125.6 \text{ km s}^{-1}$
These observations provide significant challenge for numerical models:

- TR: Temperature
- High speed upflow >45 km/s
- Joule heating
- Hot loop (1.3 MK)
- Photospheric vertical speed: red-blue.
- Magnetic field: red & blue lines.