# SH52B-03: Solar Flare Termination shock and the Synthetic Fe XXI 1354.08 Å line

**Friday, 15 December 2017**
**10:50 - 11:05**
*New Orleans Ernest N. Morial Convention Center - R02-R03*

Solar flares are one of the most energetic phenomena occurred in the solar system. In the standard solar flare model, a fast mode shock, which is often referred to as the flare termination shock (TS), can exist above the loop-top source of hard X-ray emissions. The existence of the termination shock has been recently related to spectral hardening of flare hard X-ray spectrum at energies > 300 keV. Observations of the Fe XXI 1354.08 Å line during solar flares by the IRIS spacecraft have found significant redshift with >100 km/s, which is consistent with a reconnection downflow. The ability to identify such a redshift by IRIS is made possible by IRIS's high time resolution, high spatial resolution, high sensitivity and cadence spectral observations. The ability to identify such a redshift by IRIS suggests that one may be able to use IRIS observations to identify flare termination shocks. Using a MHD simulation to model magnetic reconnection of a solar flare and assuming the existence of a TS in the downflow of the reconnection plasma, we model the synthetic emission of the Fe XXI 1354.08 Å line in this work. We show that the existence of the TS in the solar flare may manifest itself from the Fe XXI 1354.08 Å line.

## Plain Language Summary

A solar flare is a brief eruption of intense high-energy radiation from the sun's surface, associated with sunspots and causing electromagnetic disturbances on the earth, as with radio frequency communications and power line transmissions. The standard solar flare model proposes that magnetic reconnection drives solar flares and fast mode shock, which is often referred to as the flare termination shock (TS), can exist at the reconnection outflows. The existence of the termination shock has been recently related to spectral hardening of flare hard X-ray spectrum. Observations of solar flares by the IRIS spacecraft have found significant redshift with >100 km/s, which is consistent with a reconnection downflow. The ability to identify such a redshift by IRIS suggests that one may be able to use IRIS observations to identify flare termination shocks. Using a MHD simulation to model magnetic reconnection of a solar flare and assuming the existence of a TS in the downflow of the reconnection plasma, we computationally model the synthetic emission of a flare in this work. We show that the existence of the TS in the solar flare may manifest itself from IRIS observations.

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