



Institute for Space Weather Sciences Colloquium

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GX Simulator in the Era of Stereoscopic Hard X-ray Observations

The anisotropy of energetic electrons accelerated and propagating in the flaring solar atmosphere is a central question in solar flare physics. Stereoscopic observations of solar flare hard X-ray emissions simultaneously from two spacecraft (e.g., Earth-orbiting and Solar Orbiter) offer a unique diagnostic opportunity to investigate Hard X-ray anisotropy, albedo, and electron anisotropy in solar flares. However, detailed simulations of Hard X-ray emission also require data-constrained 3D modeling of the magnetic field structure and plasma properties. Currently, this is feasible only for solar active regions observed by SDO/HMI reasonably close to the disk center.

In this presentation, I will introduce an upgraded version of the GX Simulator IDL package. This enhanced tool allows for the modeling of magnetic field geometry and emissions across multiple wavelengths from various observation angles. Furthermore, I will share preliminary findings from a study involving X-ray data collected from nearly 90-degree-separated perspectives by STIX/SolO and Fermi/GBM. These results will be complemented by observations from microwave imaging spectroscopy provided by the Expanded Owens Valley Solar Array (EOVSA).

Dr. Gelu Nita is a Research Professor in the Center for Solar Terrestrial Research at the New Jersey Institute of Technology. He holds a Ph.D. in Applied Physics from NJIT and a B.S. in Physics from the University of Bucharest. He is the main architect and developer of the GX Simulator package and a member of the EOVSA instrument design and developing team.

