

3. Magnetic coupling and mass flux through the atmosphere

Relationship between Transition Region Explosive Events and Network Jets

Yajie Chen¹, Hui Tian¹, Zhenghua Huang², Tanmoy Samanta¹

¹*Peking University*

²*Shandong University*

The solar transition region (TR) is the interface between the chromosphere and corona. The dominant structures in the TR are the network structures. Recent imaging observations of the TR have revealed prevalent intermittent jets from the network lanes. The apparent speeds of the jets are normally in the range of 80-250 km/s. Another type of TR dynamic event is the TR explosive events (EEs) occurring mainly around network lanes. These events are characterized by non-Gaussian line profiles with enhanced emission at the line wings. They are generally believed to result from local magnetic reconnection. Using simultaneous imaging and spectroscopic observations from the IRIS mission, we have studied the relationship between EEs and the network jets. We first identified all EEs from the Si IV 1393.76 line profiles in our observations, then examined related features in the 1330 slit-jaw images. Some EEs appear to be located at either the foot points or higher parts of the network jets. The Si IV line profiles of these EEs often exhibit clear enhancement at the blue wings, likely resulting from the superposition of the high-speed jets on the TR background. Other EEs clearly have no connection to the network jets. Instead, they appear to be accompanied by strong compact brightenings in the 1330 images. The Si IV line profiles of these EEs are often very broad and reveal multiple peaks, likely related to magnetic reconnection.