CONNECTING THE DYNAMICS OF THE CHROMOSPHERE AND TRANSITION REGION WITH HINODE/SOT AND EIS

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Hinode/SOT Ca II broadband images and movies show that there are several different types of spicules at the limb. These different types are distinguished by dynamics on different timescales. The first type involves up- and downward motion on timescales of 3-5 minutes. The dynamics of these spicules are very similar to those of fibrils and mottles as observed on the disk. Recent work suggests that these are driven by slow-mode magnetoacoustic shocks that form when convective flows and global oscillations leak into the chromosphere along magnetic flux tubes. The second type is much more dynamic with typical lifetimes of 10-60 s. These spicules are characterized by sudden appearance and disappearance that may be indicative of rapid heating to TR temperatures. We will use coordinated Hinode SOT/EIS observations that include high-resolution magnetograms, chromospheric and TR imaging and TR/coronal spectra to study the impact both spicule types have on the TR, what role reconnection plays in creating the second type of spicules, whether these features dominate heating of the magnetized chromosphere, and more generally to connect the dynamics of the chromosphere with those of the TR. In addition, we will perform detailed comparisons of these different types of jets with synthetic Ca images derived from advanced 3D numerical simulations that encompass the convection zone up through the corona.