

Proposal Summary (Abstract) *NRA-98-03-SEC-008*

This proposal seeks continuation of the currently funded SOHO Guest Investigator Program entitled “SOHO/BBSO Coordinated Study on H α and UV jets”. From the studies performed during the last year, we have obtained the following important results on this topic: 1) We have discovered compact, round, dark and blue-shifted features from the H α data which we name them as chromospheric upflow events; 2) We have established observational evidence based on one-to-one comparisons that photospheric magnetic flux cancellation, chromospheric upflow events and transition region explosive events are closely associated with one another, and therefore represent different observable aspects of magnetic reconnection ubiquitously occurring in the quiet Sun.

Based on solid progress last year, we propose to study these observable features associated with quiet Sun magnetic reconnection more extensively. The specific objectives of our study are: 1) to investigate physical connections among the photospheric magnetic field changes, chromospheric upflow events, transition region explosive events, and presumably coronal heating and 2) to clarify the similarities and differences among various chromospheric dynamic features such as chromospheric upflow events, spicules, H α dark grains, Ca II bright points and macrospicules. Joint SOHO/SUMER/CDS/EIT and BBSO/VMG/H α observations are the most important data sources to achieve our goals. We have already demonstrated that this kind of observations is very effective in revealing the physical nature of magnetic reconnection in the quiet Sun. Continuous effort will be made for the analysis of the data obtained from joint observations. More joint observations are being planned. We also want to make use of data in SOHO archive for our study. These data will be particularly suited for investigating transition region aspects of quiet Sun magnetic reconnection in detail. It is expected that this study will contribute to understanding physical processes in quiet Sun magnetic reconnection and to evaluation its importance in heating and mass transport in the transition region and corona.

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