Radio Wave and Soft X-ray Diagnostics of Heating Events in the Quiet Solar Corona

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Sensitive observations of the quiet Sun provided by (1) the Very Large Array (VLA) in the centimeter radio range, (2) SXT on board the Yohkoh satellite, and (3) EIT on board the SoHO spacecraft in high-temperature iron line emission are investigate in the view of the coronal heating problem. The observed enhancements in coronal emission are interpreted as heating events (microflares) bringing chromospheric material to coronal temperatures, whereas the radio observations show the existence of non-thermal emission related to these heating events. The thermal energy inputs by such microflares have been found in the range from 8×10^{24}erg to 1.6×10^{26}erg, and the total energy input amounts to about 16% of the average radiated power of the coronal plasma in the quiet corona. The frequency distribution of microflares is an approximate power-law of the form $f(E) = f_0 E^{-\delta}$ with a power-law index δ between 2.3 and 2.6. As the low-energy cutoff is due to sensitivity limitations and the power-law index is steeper than 2, these observations demonstrate the possibility that microflares dominate the energy input into the quiet corona.