Title: **Microwave Type-III bursts and the diagnostics of flaring source regions**

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Abstract: One of the important tasks of solar physics is to understand the nature of solar super-thermal electrons, including: Where is the acceleration site? What does dominate the acceleration processes? What signatures do these energetic particles produce? How do these particles propagate and interact with the ambient plasmas? It is believed that solar radio Type-III bursts are the best tool of tracking super-thermal electrons, and microwave Type-III bursts can diagnose sensitively the source region of solar flares during the period of primary energy release and particle acceleration. This talk will present the recent researches on microwave Type-III bursts, including the observations of microwave Type-III bursts and Type-III pairs, theoretical methods and diagnosing results by using microwave Type-III burst pairs. The observations show that microwave Type-III burst pairs can occur in the post-flare phase as well as in the flare impulsive phase, the radio emission frequency corresponding to the flaring source region (separatrix frequency) is in the range of 1.0-3.4 GHz, the frequency drift rates of the reverse-sloped Type-III bursts are about one order of magnitude slower than that of the corresponding normal Type-III bursts. The theoretical diagnosing method considered the full MHD equation and included plasma pressure, magnetic Lorenz force and solar gravitational force, and therefore built a relationship between the physical conditions of the source region and the observing parameters of microwave Type-III bursts. The diagnosing results show that the plasma beta exceeds 1 significantly near the flaring source region, which indicates that the plasma is highly dynamic and unstable, and magnetic reconnection may occur and accelerate the ambient electrons to become super-thermal.