

# **The Evolution of A Complex Solar Radio Burst Corresponding to the Special Configuration of Microwave Sources**

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A complex radio burst associated with periodic pulsations and several kinds fine structures, e.g.,

normal- and reverse-drifting type III bursts, zebra patterns, and slowly drifting structure was observed with the radio spectrometers at the National Astronomical Observatories of China (NAOC) in Beijing and Yunnan on 19 October 2001. In combination with the images of 17 and 34 GHz from NoRH and the magnetograms from MDI we reveal the existence and evolution of preexisting and new emerging sources, and find the horseshoe-shaped structure of microwave sources of intensity during the late phase of the burst. Through the detailed comparison of the evolution of each source with the time profiles of radio bursts corresponding to these sources we indicate that the intimate correlation between the microwave source structures and the radio burst generations. Some fine structures can be considered as the MHD turbulence and plasma emission mechanism, based on the anisotropic beam instability and hybrid waves generations. From the characteristics of observations, the coronal magnetic structures should contain an extended coronal loop system and multiple discrete electron acceleration/injection sites. The mechanisms of this complex radio burst are deal with the gyroresonance and incoherent gyrosynchrotron emission from the trapped electrons and the coherent plasma emission from the nontrapped electrons.