

NoRH and RHESSI Observations of Quasiperiodic Radio and X-ray Oscillations in a Solar Flare

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We describe microwave and hard X-ray observations of strong quasiperiodic pulsations from the GOES X1.3 solar flare of 15 June 2003. Using Fourier analysis, we study the frequency- and energy-dependent oscillation periods, phase differences, and modulation depths of the radio and X-ray pulsations. Focusing on the more complete radio observations, the observational properties of the oscillations are compared with those derived from models for the radio emission. Two simple models are considered: i) gyrosynchrotron emission modulated by the quasiperiodic injection of fast electrons; ii) gyrosynchrotron emission modulated by an MHD oscillation of the magnetic field. We demonstrate that quasiperiodic injection of fast electrons is the more likely cause of the observed quasiperiodic oscillations observed in the radio and hard X-ray emission. We discuss the implications of this finding for particle acceleration and transport in the flaring sources.