NONLINEAR EXCITATION OF FAST SAUSAGE WAVES IN THE CURRENT-CARRYING CORONAL LOOPS

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We study a model of coronal loops that consists of a cylindrical core with axial magnetic field and coaxial annulus with purely azimuthal magnetic field. The magnetic field is discontinuous at the tube and core boundaries, and there are surface currents with opposite directions on these boundaries. The principal mode of fast sausage waves that has no nodes in the radial direction admits an arbitrary wavelength. It is applied to the interpretation of observed periodic pulsations of microwave emission in flaring loops with periods of a few tens of seconds. Radial plasma motions about the tube and core boundaries have opposite directions that leads to a contraction of the annulus. The principal mode can be excited by a nonlinear resonant interaction of two torsional modes localized in the core.