PARAMETRIC EXCITATION OF SURFACE MAGNETOSTATIC MODES IN AN AXIALLY MAGNETIZED ELLIPTIC CYLINDER UNDER LONGITUDINAL PUMPING

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S u m m a r y

A rigorous analytical theory of parametric excitation under the longitudinal pumping has been developed for the surface magnetostatic modes of a long elliptic ferrite cylinder magnetized along its axis with regard for the boundary conditions at the surface of the cylinder. It is shown that a pair of frequency-degenerated counter-propagating surface modes at half the pumping frequency can be parametrically excited, and the expressions for the corresponding parametric excitation threshold have been derived. The threshold demonstrates a strong dependence on the mode number and elliptic cylinder's aspect ratio and tends from above for the large aspect ratio to the value deduced on the basis of the plane-wave analysis. The simple analytical relation between the ratio of axes of the high-frequency magnetization polarization ellipse of excited surface magnetostatic oscillations and the parametric excitation threshold is obtained, discussed, and graphically illustrated.