Abstracts

Electromagnetic Instability of a Rotating Electron Layer in a Sheath Helix

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A sheath helix supports slow electromagnetic modes with phase velocity considerably Iower than the velocity of light in a vacuum. In the presence of a rotating electron layer, the modes can be resonantly driven unstable via cyclotron maser interaction. Using the perturbation technique, the growth rate of the instability is obtained in the weak-beam approximation and is seen to decrease with the slowing down of the modes. For lower order modes, the growth rate is comparable to the one with a cocentric cylindrical waveguide. However, for higher order modes, the growth rate decreases rapidly, suggesting that a sheath helix may be used to suppress the higher order modes.

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