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Cyclotron Maser Radiation From An Inhomogeneous Plasma
R.A. CAIRNS, St Andrews University, IRENA VORGUL, St Andrew University, ROBERT BINGHAM, Rutherford Laboratory — Cyclotron maser radiation is important in both laboratory devices such as gyrotrons and in space physics applications to phenomena such as auroral kilometric radiation. To understand the behaviour, especially in the latter case where there is generally a localised region of instability, requires an understanding of how such instabilities behave in an inhomogeneous plasma. Here we consider, for simplicity, a simple ring distribution of electrons in either a step function variation of magnetic field or a continuous gradient. In each case we show that there can exist localised regions of instability from which waves, growing in time, can be radiated outwards.

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