Abstracts

Propagation of Waves in a Plasma in a Magnetic Field

W.P. Allis. "Propagation of Waves in a Plasma in a Magnetic Field." 1961 Transactions on Microwave Theory and Techniques 9.1 (Jan. 1961 [T-MTT]): 79-82.

The propagation of electromagnetic waves in a plasma in a magnetic field as given by the Appleton-Hartree theory is discussed in terms of the wave normal surfaces instead of the more conventional propagation vector plots, and the "ordinary" and "extraordinary" waves are defined in terms of their polarizations instead of using a continuity argument. This gives a different picture of "a wave" which has some advantages. In particular, "whistlers" become obvious, as are regions of high reflection and high absorption. The Appleton-Hartree theory is then extended to include the effect of electron temperature, and this results in a third wave whose velocity is of the order of electron thermal motions.

❑ Return to main document.