Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

CMApp: a Dynamic Presentation of the Clemmow-Mullaly-Allis Diagram for Cold Plasma Waves[1] P. ADRIAN, U. Iowa, R.I. PINSKER, R. PRATER, GA, M. PORKOLAB, MIT — The CMA diagram contains a great deal of qualitative information about the character of cold-plasma waves and their evolution in spatially varying magnetic fields and electron density [1]. We create a dynamic version of the CMA diagram which we call CMApp, in which the user can navigate the CMA diagram and arbitrarily zoom into chosen regions. The user chooses the form of the variables and many other aspects of the generalized diagram, including whether wave-normal surfaces or inverse-wave-normal surfaces are plotted. Since the zoom level is dynamic, there is no need to use logarithmic axes, an unrealistic ion-to-electron mass ratio, or to normalize magnetic field and density to wave frequency, thus enabling the diagram to be more of a quantitative tool. Examples of the applications of CMApp to wave propagation in different parameter regimes are illustrated.

[1] T.H. Stix, "The Theory of Plasma Waves" (McGraw-Hill, New York, 1962).

[1]Work supported by the US DOE Office of Science, Office of WDTS, under the Science Undergraduate Laboratory Internship (SULI) program under DE-FC02-04ER54698.

R. Pinsker
GA

Date submitted: 17 Jul 2015 Electronic form version 1.4