

1116-35-38

**Wolfgang F. Ellermeier\*** ([ellermeier@fkp.tu-darmstadt.de](mailto:ellermeier@fkp.tu-darmstadt.de)), TU Darmstadt, Fachbereich Physik, Institut für Festkörperphysik, 64285 Darmstadt, Germany. *Diffusive Nonlinear Electrodynamics*.

A theory of electromagnetic wave propagation is presented for the low frequency regime in dissipative reactive matter. Nonlinear Ohmic, heat conductive, Debye and quadrupole dissipation is modeled by using Extended Irreversible Thermodynamics. The resulting nonlinear hyperbolic reaction diffusion equations are solved by perturbation techniques exhibiting shock structures, modulational instabilities and pattern formation. (Received June 10, 2015)