Abstract Submitted
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Rogue Waves Associated with Circularly Polarized Waves in Magnetized Plasmas[1] I. KOURAKIS, Queens University Belfast, Centre for Plasma Physics, UK, J. BORHANIAN, Univ. Mohaghegh Ardabili, Ardabil, Iran, V. SAXENA, Queens University Belfast, Centre for Plasma Physics, UK, G. VELDES, Department of Electronics, TEI of Lamia, Greece, D.J. FRANTZESKAKIS, Department of Physics, University of Athens, Greece — Extreme events occur in abundance in the ocean: an ultra-high "ghost wave" often appears unexpectedly, against an otherwise moderate-on-average sea surface elevation, propagating for a short while and then disappearing without leaving a trace. Rogue waves are now recognized as proper nonlinear structures on their own. Unlike solitary waves, these events are localized in space and in time. Various approaches exist to model their dynamics, including nonlinear Schrodinger models, Ginzburg-Landau models, kinetic-theoretical models, and probabilistic models. We have undertaken an investigation, from first principles, of rogue waves in plasmas in the form of localized events associated with electromagnetic pulses. A multiple scale technique is employed to solve the fluid-Maxwell equations for nonlinear circularly polarized electromagnetic pulses. A nonlinear Schrodinger (NLS) type equation is shown to govern the amplitude of the vector potential. A set of non-stationary envelope solutions of the NLS equation is presented, and the variation of their structural properties with the magnetic field are investigated.

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Ioannis Kourakis
Queens University Belfast, Centre for Plasma Physics

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