

# Physics Society Seminar

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Speaker	<b>Dr. Sita Sundar</b>
Affiliation	Postdoctoral Researcher, Christian-Albrechts-Universität zu Kiel , Kiel, Germany
Title	Nonlinear 1D solitons in Laser-Plasmas
Date	22 <sup>nd</sup> February 2016
Time	2.00 PM
Venue	R107 in Tutorial block
Abstract	<p>Interaction of ultra-intense laser with plasma exhibits a rich variety of interesting nonlinear phenomena. Numerical and asymptotic solutions describing the interactions of relativistically intense plane electromagnetic waves and cold plasmas are of fundamental importance for nonlinear science and are considered to be a basic component of turbulence in plasmas. The numerical identification of solitons stimulated a renewed interest in developing an analytical model [1,2] and in envisaging ways of detecting solitons experimentally[3]. The inclusion of ion response in the relativistically intense electromagnetic laser pulse propagation in plasma yields certain distinct varieties of single peak solitonic structures. A flat-top slow moving structure is one such solution[4]. Here, we present detailed characterization of these flat-top solutions along with the eigen spectrum of their formation in the parameter space. The study shows that the flat top solution is unstable and the instability is characterized as the backward Brillouin instability for which the electron quiver velocity plays the role of the effective temperature.</p> <p>[1]P. Kaw et. al. Phys. Rev. Lett. 68, 21 (1992). [2]T. Zh. Esirkepov et.al., JETP Lett. 68, 36 (1998). [3] M. Borghesi et. al. Phys. Rev. Lett. 88, 135002 (2002). [4] S. Sundar et.al. Phys. Plasmas 18, 112112 (2011).</p>
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