ЛАБОРАТОРИЯ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ

Четверг, 1 августа 2019 г. в 11.00

Ком. 310

Stefani Apostolova Panayotova

(University of Plovdiv Paisii Hilendarski (Plovdiv, Bulgaria)
Department of Physics, Sofia University(Sofia, Bulgaria)

Analytical study of non-dissipative double sine-Gordon equation

The sine-Gordon equation is a nonlinear hyperbolic partial differential equation involving the d'Alembert operator and the sine of the unknown function. It arises in various areas for example in differential geometry, relativistic field theory, Josephson junctions which are often used in the modern nanotechnology, mechanical transmission lines, etc. There are cases from the fundamental science, for example in condensed matter physics that are interesting in terms of their application in modern nanoelectronics, which are described by more complicated equation called “double sine-Gordon equation”. It contains a second sinus of the doubled unknown function. From various physical theories, such as fluid dynamics and, of course, quantum theories it is well known that it is essential to study the stationary case first. In this case the dissipative part of double sine-Gordon equation disappears. This leads to the conservation of the full energy in the system. In this context the mathematical model became fully integrable. In the presented work, provoked by the lack of a dissipative term, explicit analytical solutions are derived. It is important to note that such analytical study provides serious guidelines of the numerical investigation of highly non-linear models of different systems.