



The Abdus Salam  
**International Centre  
for Theoretical Physics**



**Conference on Frontiers of Nanoscience  
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## **POSTER No.1**

### **Space Squeezing Quenches in Classical Integrable Systems**

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#### Abstract:

We consider soliton propagation in the integrable systems which undergoes sudden changes of the non-linearity parameter, the quench. The non-linearity parameter determines the relation between the width and height of the soliton. So effectively, we describe our quench as a uniform squeeze of the spatial coordinate by the factor of  $\eta$ . We find explicit values of  $\eta$  such that one soliton splits exactly into an integer number of solitons and describe analytically parameters of the obtained solitons. Our method is based on the direct scattering problem, and can be applied for any integrable system. In this manuscript we illustrate soliton splitting for Kortewig-de-Vries, Sine-Gordon and Non-linear Schroedinger integrable systems.



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## **POSTER No.2**

### **Exact Results on a Mobile Impurity in One-dimensional Fermi Gas**

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#### Abstract:

We investigate a free Fermi gas interacting with a single impurity particle of equal mass in one spatial dimension. We obtain a Fredholm determinant representation for the time-dependent correlation function of the impurity particle and for the asymptotic average momentum. We also present full-time dynamics obtained from the direct form-factor summation, as well as results from the kinetic theory.