



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



**Advanced Workshop on  
"Anderson Localization, Nonlinearity and  
Turbulence: A Cross-Fertilization"**

**ICTP, Trieste, Italy, 23 August - 3 September 2010**

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**TITLE:**

**"Scaling of energy spreading in strongly nonlinear disordered lattices"**

**ABSTRACT:**

We study the spreading behavior of initially local states in disordered, strongly nonlinear lattices. Similar to nonlinear systems with Anderson localization, here the spreading sets up solely due to chaotic nonlinear interaction of localized linear or nonlinear modes. But in contrast to those models, in our system the spreading states exhibit superexponential tails which allows for a better analysis of the spreading behavior. Based on a phenomenological description by virtue of a nonlinear diffusion equation we establish a one-parameter scaling relation between the velocity of spreading and the density. From this scaling it follows that for very low densities the spreading slows down compared to the pure power law.