

VII Leopoldo García-Colín Mexican Meeting on Mathematical and Experimental Physics



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ALBERTO ROBLEDO: Localization, a nonlinear dynamical equivalent and its presence in complex systems

Tuesday, 18 February 2020 12:30 (1 hour)

We describe a particular excursion into the study of the localization phenomenon, kept within a family of simple model systems for the scattering of a propagating wave. The models are fully solvable and suitable for revealing an analogous nonlinear dynamical problem. A recursion relation for the system-size dependence of the scattering matrix relates to a bifurcation diagram where single point and weakly chaotic attractors represent insulating and conducting regimes, and the in-between transition to chaos characterizes the mobility edge. While the simplicity of the models allows for the consideration of other localization phenomena, like those for light and sound, its mathematical description can be couched in the language of Möbius transformations in the complex plane, and this in turn can be directed to abstract number theoretical questions and properties. Finally, we sketch extensions of these studies towards the modeling of coherent collective patterns and motion in complex systems composed of living entities.

Session Classification: PLENARY TALKS

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