

SEMINARIO

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Factorization method extension and Symmetry determination

Abstract: Factorization methods have been applied to study one-dimensional systems. We are going to show how to generalize that method to analyze integrable systems regardless of their dimension. This method considers the dimensional decomposition of integrable systems creating Ladder and Shift operators whose combined effect modify the values of the Casimir operators, that grant said decomposition, these operators allow us to study the systems symmetry. We are going to show the basis of this generalization exploring already studied systems such as the Harmonic Oscillator and Kepler-Coulomb, this allows us to compare the results obtained with this method. Since these operators are crafted considering Shift and Ladder properties, they can be used to define the states of the system in the quantum mechanics frame as well as Action-Angle coordinates in classical mechanics. Once we have shown the way of this model, we can consider more complex systems such as the Smorodinsky-Winternitz model.

**Sala de Seminarios, Departamento de Física Teórica, Atómica y Óptica
Miércoles 26 de Octubre de 2022 (13:00)**

Organiza: MathPhys

