

**SEMINARIO**  
**Departamentos de Física Teórica I y II**  
**Universidad Complutense de Madrid**

**INVITADO:** Prof. Senthilvelan

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**TITULO:** On the non-standard conservative Hamiltonian description of  
certain damped nonlinear oscillators

**LUGAR:** FACULTAD DE CIENCIAS FÍSICAS UCM

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**HORA:** 14:30

**AULA:** Seminario Depto. Física Teórica II, Planta 2ª

**ABSTRACT**

In this talk, we point out the presence of nonstandard conserved Hamiltonian structures in a class of dissipative/damped systems. To start with we consider the damped harmonic oscillator and construct time independent integral for all values of the system parameters. From the latter we identify an appropriate time independent nonstandard Lagrangian/Hamiltonian. We show that the canonical equations are lead to the standard dynamical description. We then consider a Lienard type damped nonlinear oscillator (modified Emden equation with linear external forcing term) and demonstrate the presence of conservative Hamiltonian description in this system. We also point out the method of finding first integral and the explicit form of time independent non-standard Hamiltonian. Further, we discuss the exact quantization of this nonstandard Hamiltonian both semi-classically and quantum mechanically. Finally, we demonstrate the existence of nonstandard conservative Hamiltonian structures in a general class of damped nonlinear oscillators.