



Contribution ID : 70

Type : **parallels**

## **Deformed Toda model coupled to matter spectra: Majorana zero-modes, bound states in-gap and in the continuum.**

*Saturday, 18 December 2021 10:00 (30)*

A deformed Toda model coupled to Dirac field (DATM) is considered. The DATM is regarded as a quasi-integrable model since it is a deformation of the integrable affine Toda model coupled to matter by introducing a scalar potential. It is defined as a fermion and scalar fields chirally coupled plus a scalar self-coupling potential. We show that it has remarkable properties with spectra composed by Majorana zero-modes, in-gap and in the continuum bound states. In order to find the soliton-fermion solutions we make use of the tau function formalism. Our results may find many applications in several branches of non-linear physics, such as QCD<sub>2</sub>, superfluidity, superconductivity and quantum computing.

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**Session Classification :** keynotes

**Track Classification :** Nuclear and Particles