



Contribution ID: 8

Type: **not specified**

Bound states in a continuum in three-body systems of cold atoms

Tuesday 19 August 2025 13:25 (25 minutes)

We present a theoretical study of lifetimes of three-body resonances, focusing on the decay into a deep dimer and an unbound particle. By employing a two-channel model, we show that the width of resonances can vanish entirely by tuning of system parameters. A resonance with vanishing width can be interpreted as a stable bound state in the continuum, a phenomenon not yet observed in cold-atom systems. We illustrate this mechanism with two examples: a mass-imbalanced system in 1D, where an approximate analytical expression is derived, and a system of three identical bosons in 3D, closely related to the Efimov scenario. Most importantly, the latter system can exhibit bound states in a continuum by tuning an external magnetic field, a parameter well accessible in cold-atom experiments. Moreover, we provide some introduction and relation between systems of cold atoms and those in nuclear and hadron physics.

Author: HAPP, Lucas

Presenter: HAPP, Lucas

Session Classification: Researcher session