



Contribution ID: 224

Type: **Talk**

【404】 Observation of confinement-induced resonances in a 3D lattice

Tuesday 31 August 2021 14:15 (15 minutes)

We report on the observation of confinement-induced resonances (CIRs) for strong zero-dimensional (0D) confinement in a three-dimensional (3D) optical lattice potential. Starting from a Mott-insulator state with mainly single-site occupancy, we detect loss and heating features at specific values for the confinement length scale and the 3D scattering length. Two independent models, describing the coupling between the center-of-mass and the relative motion of the particles as mediated by the lattice, predict the resonance positions to a good approximation, suggesting a universal behavior. Our results show that CIRs exist for any dimensionality and open up a new method for interaction tuning and controlled molecule formation under strong 0D confinement.

Primary authors: CAPECCHI, Deborah (University of Innsbruck-Institut of experimental physics); Prof. NÄGERL, Hanns-Christoph (University of Innsbruck)

Co-authors: CANTILLANO, Camilo (University of Innsbruck); Dr MARK, Manfred; Dr MEINERT, Florian; Dr SCHINDEWOLF, Andreas; Dr LANDINI, Manuele (University of Innsbruck); Prof. SAENZ, Alejandro; Prof. REVUELTA, Fabio

Presenter: CAPECCHI, Deborah (University of Innsbruck-Institut of experimental physics)

Session Classification: Atomic Physics and Quantum Optics

Track Classification: Atomic Physics and Quantum Optics