Contribution ID: **6** Type: **not specified**

Spin-waves and multimerization for many-body bound states in the continuum in one-dimensional qubit arrays

Wednesday, 11 December 2019 12:45 (15 minutes)

Bound states in the continuum are extensively studied both theoretically and experimentally, with the aim of implementing noiseless memories. In quantum optics, models adopted for their description make use of the dipolar interaction, representing an exactly solvable case in the one-excitation sector. We characterize the eigensystem for any number of equally spaced qubits embedded in one dimension using non-perturbative techniques, giving an explicit proof of excitation amplitude profiles ruled by spin-waves and including a description of the degeneracy lifting obtained through the full analytic structure of the complex energy plane imposed by the form factor. For any odd number of qubits, the singularity condition can be factorized, so yielding the emergence of multimers, consisting in subsystems separated by two lattice spacings not filled by the electromagnetic field. Our model is suitable for the description of steady states in waveguide QED, even if its abstraction includes more general bosonic fields.

Primary authors: POMARICO, Domenico (BA); FACCHI, Paolo (BA); LONIGRO, Davide (BA); PEPE, Francesco Vincenzo (BA); PASCAZIO, Saverio (BA)

Presenter: POMARICO, Domenico (BA)

Session Classification: Session 2