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*Spectral and Scattering theory of non-relativistic QFT models*

We plan to give a survey of recent results on models of non-relativistic Quantum Field Theory describing a non-relativistic atom coupled to a quantized radiation field. The models we will consider are the *Pauli-Fierz model* describing an atom minimally coupled to the quantized electromagnetic field and the *Nelson model* where the atom is coupled to a scalar boson field. If time permits the following topics will be covered:

I) Quantization of the Schroedinger+Klein-Gordon and Schroedinger+Maxwell field equations in the Coulomb gauge, selfadjointness of the Nelson and Pauli-Fierz Hamiltonians.

II) HVZ theorem, existence of ground states.

III) Scattering theory in QFT, LSZ approach, asymptotic fields, wave operators, asymptotic completeness.

IV) Infrared problem in QFT, generalized coherent states, modified wave operators.

V) Open problems.