

## Proposals for theory talks

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**1. Title: Relativistic Coulomb interaction**

*Task:* For better understanding of relativistic ion-atom collisions it is important to account for the Lorentz transformation of the Coulomb interaction between charged particles. Such a Lorentz-transformed potential is known as the Lienard-Wiechert potential. In this contribution, one needs to explain derivation of this potential and to explain its role in the analysis of ion-atom collisions for the example of Coulomb excitation.

*Literature:* [1] J. Eichler, Lectures on Ion-Atom Collisions: From Nonrelativistic to Relativistic Velocities, Elsevier Science, 2005; [2] J. Eichler and W. Meyerhof, Relativistic Atomic Collisions, Academic, San Diego, 1995; [3] Th. Stöhlker et al, Physics Letters A 238 (1998) 43.

**2. Title: Impulse approximation for ion-atom collisions**

*Task:* A rather simple theoretical approach for the theoretical description of fast collisions between highly-charged ions and atomic (molecular) targets is given by the impulse approximation. By introducing first idea of the momentum distribution of electrons in target atom (molecule) one will need to explain the basic ideas of this approximation. To illustrate the use of the impulse approximation, one may recall recent calculations on the radiative electron capture.

*Literature:* [1] J. Eichler, Lectures on Ion-Atom Collisions: From Nonrelativistic to Relativistic Velocities, Elsevier Science, 2005; [2] J. Eichler and Th. Stöhlker, Phys. Rep. 439 (2007) 1

**3. Title: Pauli equation for one-electron ions**

*Task:* In place of using exact but rather complicated Dirac equation for the description of structure and dynamics of medium- and high-Z ions, it might be convenient to apply the so-called Pauli approximation. In this talk, one will to explain derivation and physical meaning of this equation.

*Literature:* [1] B. H. Bransden and C. J. Joachain, Physics of atoms and molecules, Longman, 1990.