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Quantum mechanical models for the Fermi shuttle¹ JAMES STERNBERG, University of Tennessee, S. YU. OVCHINNIKOV, University of Tennessee and the Ioffe Institute, J.H. MACEK, University of Tennessee and Oak Ridge National Laboratory — Although the Fermi shuttle was originally proposed as an explanation for highly energetic cosmic rays, it is also a mechanism for the production of high energy electrons in atomic collisions [1]. The Fermi shuttle is usually thought of as a classical effect and most models of this process rely on classical or semi-classical approximations. In this work we explore several quantum mechanical models for ion-atom collisions and examine the evidence for the Fermi shuttle in these models.

[1] B. Sulik, Cs. Koncz, K. Tokési, A. Orbán, and D. Berényi, *Phys Rev. Lett.* **88** 073201 (2002)

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