

Abstract Submitted  
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**Studying angular and radial correlation in atomic systems by means of the transfer-ionization process** A.L. GODUNOV, COLM T. WHEALN, Department of Physics, Old Dominion University, Norfolk, VA 23529-0116, H.R.J. WLATERS, Department of Applied Mathematics, and Theoretical Physics, The Queen's University of Belfast, Belfast BT7 1NN, UK, V.S. SCHIPAKOV, Troitsk Institute for Innovation and Fusion Research, Troitsk, 142092, Russia, M. SCHÖFFLER, V. MERGEL, R. DÖRNER, O. JAGUTZKI, L.P.H.H. SCHMIDT, J. TITZE, H. SCHMIDT-BÖCKING, Institut für Kernphysik, Universität Frankfurt, August-Euler-Str. 6, 60486 Frankfurt, FRG — We report a joint theoretical-experimental study of the transfer ionization process  $p + \text{He} \rightarrow \text{H}^0 + \text{He}^{2+} + e^-$  for different collision geometries, where the collision fragments were detected in coincidence. We demonstrated that the fully differential cross section was sensitive to both radial and angular correlation in the target. We have, we believe, demonstrated conclusively that the mechanism proposed by Schmidt-Böcking does indeed give the dominant contribution to the transfer-ionization process. Both theory and experiment are now in good accord and indicate that transfer ionization in fast collisions at small scattering angles is very sensitive to high-level target correlation effects.

1. A.L. Godunov, Colm T. Whelan and H.R.J. Walters, *J. Phys. B:* **37**, L201 (2004); 2. A.L. Godunov, Colm T. Whelan and H.R.J. Walters et al, *Phys. Rev. A* (2005) (submitted); 3. M. Schöffler, A.L. Godunov, Colm T. Whelan, et al *J. Phys. B:* (2005) (submitted)

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