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**Generalized Sturmian Functions approach for double photoionization of He** JUAN M. RANDAZZO, Centro Atomico Bariloche, Argentina, GUSTAVO GASANEO, Universidad Nacional del Sur, Argentina, LORENZO UGO ANCARANI, Université de Lorraine, France, FLAVIO D. COLAVECCHIA, Centro Atomico Bariloche, Argentina, DARIO M. MITNIK, IAFE, Buenos Aires, Argentina
— Various techniques have been developed in the last decade allowing the ab initio treatment of three-body Coulomb problems. One of the most recent ones is the Generalized Sturmian Function (GSF) method that we have developed [1]. This spectral method allows one to correctly describe bound states of a large variety of systems, but more importantly to generate double continuum wave function for break-up processes possessing the correct asymptotic behavior. In the method, the scattering wave function is expanded in a properly symmetrized product of continuum-type, radial, generalized Sturmian basis functions. The proposal is then used to solve the driven equation for a given process. During the last years, we have studied several S-wave collision models which allowed us to understand the way in which the entangled, three–body, continuum wave is constructed. In this contribution, we consider the full three–body Schrödinger equation for the double photoionization of He at intermediate incident energies. We will illustrate the success of the GSF method by comparing our theoretical cross sections (within different gauges) with those obtained with other approaches and with experimental data.

[1] G. Gasaneo et al, submitted to Adv. in Quantum Chem.; Mitnik et al, Comp. Phys. Comm. 182, 1145 (2011).

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