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**Quasi-Sturmian approach to two- and three-body continuum Coulomb problems** JESSICA A. DEL PUNTA, MARCELO J. AMBROSIO, GUSTAVO GASANEO, Universidad Nacional del Sur, Argentina, LORENZO UGO ANCARANI, Universite de Lorraine, France, DARIO M. MITNIK, IAFE, Buenos Aires, Argentina, S.A. ZAYTSEV, M.S. ALESHIN, Khabarovsk, Russia — In this work we present new two-body basis functions to be used when solving atomic physics scattering problems. We name them Quasi Sturmian (QS) because of the resemblance of their generating equation with that of Generalized Sturmian (GS) sets [1]. They can be thought of a generalization of the Green function as they satisfy a non-homogeneous Schrödinger equation where the delta function is replaced by any element of a $L^2$ basis set. The QS functions are regular at the origin, form a complete basis set with scattering asymptotic form and, by construction, solve the interactions appearing in the original Schrödinger equation. Once a set of QS is generated, it can be used to expand a scattering solution. In comparison with well established GS functions, our numerical investigations showed that the proposed QS possess convergence superiority. Initially set for two-body interactions, the proposal can be easily extended to three-body problems. For a two-body Coulomb scattering problem, and taking Laguerre basis functions as $L^2$ basis set, the QS functions can be expressed analytically. As a consequence, when QS are applied to three-body scattering calculations, analytical expressions result for all necessary matrix elements. Furthermore, the properties of the two-body basis functions allow one for an analytical study of the three-body wave function itself. [1] Mitnik et al, Comp. Phys. Comm. 182, 1145 (2011)

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