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: A novel approach to include proton-proton Coulomb force into the 3N continuum calculations

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Recently introduced novel approach to include the proton-proton Coulomb force into the momentum space 3N Faddeev calculations will be presented. It is based on a standard formulation for short range forces and relies on a screening of the long-range Coulomb interaction. In order to avoid all uncertainties connected with an application of the partial wave expansion, unsuitable when working with long-range forces, we apply directly the 3-dimensional proton-proton screened Coulomb t-matrix. That main new ingredient, the 3-dimensional screened proton-proton Coulomb t-matrix, is obtained by a numerical solution of the 3-dimensional Lippmann-Schwinger equation. Using a simple dynamical model for the nuclear part of the interaction the feasibility of that approach will be demonstrated. The physical elastic proton-deuteron scattering amplitude has a well defined screening limit and does not require renormalisation. Well converged elastic proton-deuteron cross sections are obtained at finite screening radii. Also the proton-deuteron breakup observables can be determined from the resulting on-shell 3N amplitudes increasing the screening radius. However, contrary to the proton-deuteron 'elastic scattering, the screening limit exists only after renormalisation of the proton-proton t-matrices.