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Dirac Oscillators and the Relativistic R-matrix JANINA GRINEVICIUTE, DEAN HALDERSON, Western Michigan University — The R matrix formalism has been constructed for coupled channel reactions in which binary breakup channels satisfy relative Dirac equations. The basis for the expansion of the internal wave function is Dirac oscillators. An example of the calculations is calculating observables for proton scattering using the relativistic Love - Franey amplitudes of Horowitz.[1] The R matrix formalism allows the nonlocal exchange terms to be calculated exactly. Exact and approximate treatments of the exchange term give different results, which can be traced to matrix elements of negative energy states. Another advantage of the R matrix approach is ability to make scattering states orthogonal to bound states which is important at low energies.

[1]C. J. Horowitz, Phys. Rev. C 31, 1340 (1985)

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