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Matrix continued fractions for relativistic equations ZOLTAN PAPP, Cal State Univ- Long Beach — One of the basic equations of relativistic quantum mechanics, the Klein-Gordon equation, does not meet the postulates of quantum mechanics. The time evolution of the state is not determined solely by the wave function and the equation is not in a Hamiltonian form. However, it is possible to rewrite the Klein-Gordon equation into a Hamiltonian from. These are the Feshbach-Villars equations. The Klein-Gordon wave function is split into two components and for the components we have a Schrdinger-like equation with matrix Hamiltonian. This matrix Hamiltonian is not Hermitian and the wave function components are coupled by the long-range-type kinetic energy operator. In this work we considered a Coulomb plus short range potential problem in integral equation form. The operators are represented in a Coulomb-Sturmian basis. In this basis the Coulomb Hamiltonian is an infinite band matrix, and thus the corresponding Greens operator can be represented by a matrix continued fractions. This solution method provides very accurate results on a relatively small basis.

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