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Numerical Solutions to the Time-Dependent, Coupled Dirac Equation ATHANASIOS PETRIDIS, KHINLAY WIN, Drake University — The time-dependent Dirac equation for interacting spinors is solved using the numerical staggered leap-frog algorithm. This method is very stable, fast and easily implemented on standard desk-top computers without any loss of accuracy. The relativistic decay of spinors initially set in potential wells that are constant in time is studied and found to exhibit strong non-exponential features as well as non-monotonic dependence on the potential strength. The problem of two spinors coupled by means of their electromagnetic potentials is addressed in one spatial dimension in free space and in external spatially periodic potentials. This system may represent a decaying meson.

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