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Time-dependent solutions to the Dirac equation KHIN LAY WIN, ATHANASIOS PETRIDIS, Drake University — The time-evolution of Dirac spinors is studied using the numerical staggered-leap-frog method. This technique is shown to be very precise, stable, and fast. Numerical results regarding the zitterbewegung of the expectation values and standard deviations of the spin and the position are obtained and found to be in agreement with analytical calculations whenever those are possible. The time-development of the decay of near-resonance spinors initially set inside a potential well is studied and compared to non-relativistic results. The decay of states away from resonance is also examined. All the calculations are performed using an average personal computer.

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