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Anderson localization modeled by means of numerical solutions of the Schrödinger equation[1] NAGENDRA DHAKAL, SERGIO TAFUR, MICHAEL LEUNBERGER, UCF — We developed codes for simulating the Schrödinger equation based on the finite-difference time-domain (FDTD) method. We model the 2 dimensional free electron gas system using perfectly matched layers for the open surrounding space. We study the effect of localized impurities on the time evolution of the electron wave function, thereby observing dephasing introduced by the impurities. Our numerical simulations show the decoherence due to the impurities at moderate impurity densities and Anderson localization at high impurity densities. Our results are important for the implementation of quantum computing, quantum communication, and spintronics.

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