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MLET, MULTI LAYER ELECTRON TRANSPORT PROGRAM FOR PERSONAL COMPUTERS

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Introduction This paper describes a computer program, MLET, that calculates electron trajectories in three dimensions through a series of user-defined material layers and electron energy deposition profiles over the range of 1.0 keV to 10 MeV. The program, which operates on a personal computer, uses a Monte-Carlo technique to calculate and display individual electron paths through layers of target materials. Electron energies, incident angles, layer materials composition and number of electrons are easily entered into the user-friendly program. Intuitive menus make the program straightforward to initialize and run. MLET is fully three dimensional calculation program, generating and plotting complete particle trajectories as part of its operation. The output is in the form of dose-depth charts, electron trajectory plots and computer files. The MLET code was developed using the MS VisualBasic 4.0 (32 bit) compiler and runs under the MS Windows95 operational system.

Results The numerical results produced by MLET has a good agreement with experimental data as well as classical electron transport computer programs such as EDMULT and ITS v3.0. The MLET program runs with adequate speed, typically calculating up to several hundred complete electron trajectories per minute with an accuracy comparable to codes that require a main frame computer.

Conclusion **The MLET program was developed with the main purpose to be used in medical physics teaching and training. However, the high level of accuracy that can be achieved, permits extending its application field into the area of electron internal dosimetry.**