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物理

高能电子在加速器靶物质中射程的数值模拟

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摘要 为确定高能电子在加速器重金属靶物质中的射程，用蒙特卡罗方法计算能量为1~100 MeV的高能电子在加速器常用的重金属靶物质(金、钨、钽、钼)中的射程。将1~20 MeV电子在钨靶中射程的计算结果与已发表数据进行对比，计算结果与已发表数据符合较好。对射程计算结果进行数值拟合，得到了实用性较强的1~100 MeV宽能区内电子在常用加速器靶物质中的射程计算公式。该公式可为高能电子加速器靶的设计计算提供参考数据。

关键词 射程 重金属靶 加速器 蒙特卡罗方法

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Numerical Simulation on Range of High-Energy Electron Moving in Accelerator Target

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Abstract In order to determine the range of high-energy electron moving in accelerator target，the range of electron with the energy range of 1 to 100 MeV moving in common target material of accelerator was calculated by Monte-Carlo method. Comparison between the calculated result and the published data were performed. The results of Monte-Carlo calculation are in good agreement with the published data． Empirical formulas were obtained for the range of high-energy electron with the energy range of 1 to 100 MeV in common target material by curve fitting, offering a series of referenced data for the design of targets in electron accelerator.

Key words Range _ heavy metal target _ accelerator _ Monte-Carlo method

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