

技术及应用

## 双源距密度测井的蒙特卡罗数值模拟

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收稿日期 2006-4-20 修回日期 2006-9-4 网络版发布日期: 2007-10-10

**摘要** 利用蒙特卡罗方法对双源距密度测井进行数值模拟, 获得了双源距密度测井的能谱、探测器计数率与地层密度的关系和脊肋图等特性曲线。与实验结果进行对比, 验证了数值模拟的正确性, 并在此基础上, 就短源距和短源距准直孔角度等测井仪器结构参数的改变对测井性能的影响进行了研究。研究表明, 短源距为18~20 cm、短源距准直孔角度为45°时, 可满足测井灵敏度和密度补偿准确度的要求。

**关键词** [密度测井](#) [蒙特卡罗方法](#) [康普顿散射](#) [脊肋图](#) [源距](#)

**分类号** [TL142](#); [TL99](#)

## Monte-Carlo Numerical Simulation of Dual-Detector Density Logging

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**Abstract** Monte-Carlo method was used to simulate the dual-detector density logging. Energy spectra, the relation of detector count ratio and formation density and the spine-and-rib plot were calculated and compared with experimental results, and it is proved that the simulation is valid. Based on these results, the effect of density logging instrument structure (for example, short spacing and short-spacing collimator angle) on logging was studied. The research results prove that the requirements of logging sensitivity and compensated density precision are met when short spacing is 18-20 cm and short-spacing collimator angle is 45°

**Key words** [density logging](#) [Monte-Carlo method](#) [Compton scattering](#) [spine-and-rib plot](#) [spacing](#)

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