

<<计算物理简明教程>>

图书基本信息

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## <<计算物理简明教程>>

### 内容概要

《计算物理简明教程》介绍了“计算物理”学科中的几种基本常用方法，具体内容包括：误差分析、有限差分和内插法、数值积分方法、矩阵算法、常微分方程差分解法、偏微分方程解法、蒙特卡罗模拟方法等。

《计算物理简明教程》可供物理专业的本科生作为“计算物理”课程教材使用，也可供从事数值计算的相关专业的研究生参考。

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## 章节摘录

Round-off errors, which are often produced when a fixed number of significant digits is used, can be as large as 5 in the first neglected place or one-half in the last retained place. When a value is added to a much smaller value, the round-off can be large relative to the smaller value. For example, if 23456 is added to 10.518 in five digits, the result is 23467, with a round-off error of  $-0.482$ . If 23456 is subtracted from the answer, the result is 11. Thus, in five digit arithmetic,  $(23456 + 10.518) - 23456 = 11.0$ , which has an error in the third place. After the addition, the error was less than one-half in the last place, but the subtraction removed the three leading digits, 234, moving this error to the third place. This phenomenon is called cancelation. It does not cause errors but makes the size of errors already introduced larger relative to the computed result. Thus, although round-off errors are small, their effect in the final answer can be large, so that one of the tasks of the numerical analyst is to devise or modify computational schemes to minimize the effect of these errors.

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