

图书基本信息

书名：<<玻色-爱因斯坦凝聚中的量化涡旋及其动力学>>

13位ISBN编号：9787030340740

10位ISBN编号：7030340744

出版时间：2012-5

出版时间：科学出版社

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页数：134

字数：409000

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内容概要

玻色-爱因斯坦凝聚中的量化涡旋及其动力学（英文版）的特点与独到之处是我们设计了一种模守恒且能量递减的数值方法来求得静态的Gross-Pitaevskii方程（组）的数值解；我们也设计了一种高精度且快速的方法-时间分裂谱方法来求解动态的Gross-Pitaevskii方程（组）的数值解；并用所求得的数值解来分别模拟玻色-爱因斯坦凝聚体的基态与动力学，特别是揭示了基态中的涡旋现象及涡旋运动规律。

玻色-爱因斯坦凝聚中的量化涡旋及其动力学（英文版）提出的高效数值方法可以为人们利用计算机研究玻色-爱因斯坦凝聚现象提供理论方法，加深人们对第五种物质-玻色-爱因斯坦凝聚体的理解，最终使人们更方便掌握这种物质现象的各种规律，以便更好地使之在国民经济建设中发挥作用。

玻色-爱因斯坦凝聚中的量化涡旋及其动力学（英文版）提出的高效数值方法使用方便，不仅仅只可以用在研究玻色-爱因斯坦凝聚现象，还可以推广应用到其它科学问题之中：例如一般能量泛函在有限制性条件下的求极值计算问题、具有守恒率的偏微分方程（组）的数值求解问题等。

玻色-爱因斯坦凝聚中的量化涡旋及其动力学（英文版）在在描述理论和数值方法过程中深入浅出，从简单到复杂，循序渐进。

既有深奥的理论说明，又有详细的算法推导过程；既有原始的物理模型，又有数学的简化过程；这些让读者既领悟到了数值模拟的具体过程，又了解了玻色-爱因斯坦凝聚这一极低温度的物理现象。

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