<<相空间中的调和分析>>

图书基本信息

书名：<<相空间中的调和分析>>

13位ISBN编号：9787510005428

10位ISBN编号：7510005426

出版时间：2009-8

出版时间：世界图书出版公司

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页数：277

前言

The phrase "harmonic analysis in phase space" is a concise if somewhatinadequate name for the area of analysis on Rn that involves the Heisenberggroup, quantization, the Weyl operational calculus, the metaplectic representa-tion, wave packets, and related concepts: it is meant to suggest analysis on theconfiguration space Rn done by working in the phase space Rn x Rn. The ideasthat fall under this rubric have originated in several different fidds——Fourieranalysis, partial differential equations, mathematical physics, representationtheory, and number theory, among others. As a result, although these ideas areindividually well known to workers in such fields, their close kinship and thecross-fertilization they can provide have often been insufficiently appreciated.One of the principal objectives of this monograph is to give a coherent accountof this material, comprising not just an efficient tour of the major avenues butalso an exploration of some picturesque byways. Here is a brief guide to the main features of the book. Readers shouldbegin by perusing the Prologue and perhaps refreshing their knowledge aboutGaussian integrals by glancing at Appendix A.

Chapter I is devoted to the description of the representations of the Heisen-berg group and various integral transforms and special functions associated tothem, with motivation from physics. The material in the first eight sectionsis the foundation for all that follows, although readers who wish to proceedquickly to pseudodifferential operators can skip Sections 1.5-1.7. The main point of Chapter 2 is the development of the Weyl calculusof pseudodifferential operators. As a tool for studying differential equations, the Weyl calculus is essentially equivalent to the standard Kohn-Nirenbergcalculus——in fact, this equivalence is the principal result of Section 2.2——but itis somewhat more elegant and more natural from the point of view of harmonicanalysis. Its close connection with the Heisenberg group yields some insightswhich are useful in the proofs of the Calder6n-Vaillancourt (0, 0) estimate andthe sharp Grding inequality in Sections 2.5 and 2.6 and in the argumentsof Section 3.1. Since my aim is to provide a reasonably accessible introduc-tion rather than to develop a general theory (in contrast to H6rmander [70]), I mainly restrict attention to the standard symbol classes S.

内容概要

The phrase "harmonic analysis in phase space" is a concise if somewhatinadequate name for the area of analysis on Rn that involves the Heisenberggroup， quantization， the Weyl operational calculus， the metaplectic representa-tion， wave packets， and related concepts： it is meant to suggest analysis on theconfiguration space Rn done by working in the phase space Rn x Rn. The ideasthat fall under this rubric have originated in several different fidds——Fourieranalysis， partial differential equations， mathematical physics， representationtheory ， and number theory， among others.

书籍目录

编辑推荐

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