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Titolo	The Weyl operator and its generalization // Leon Cohen
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Edizione	[1st ed. 2013.]
Descrizione fisica	1 online resource (166 p.)
Collana	Pseudo-differential operators, theory and applications ; ; v. 9
Disciplina	530.15
Soggetti	Boundary value problems - Weyl theory Phase space (Statistical physics)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- The Fundamental Idea, Terminology, and Operator Algebra -- The Weyl Operator -- The Algebra of the Weyl Operator -- Product of Operators, Commutators, and the Moyal Sin Bracket -- Some Other Ordering Rules -- Generalized Operator Association -- The Fourier, Monomial, and Delta Function Associations -- Transformation Between Associations -- Path Integral Approach -- The Distribution of a Symbol and Operator -- The Uncertainty Principle -- Phase-Space Distributions -- Amplitude, Phase, Instantaneous Frequency, and the Hilbert Transform -- Time - Frequency Analysis -- The Transformation of Differential Equations into Phase Space -- The Representation of Functions -- The N Operator Case.
Sommario/riassunto	This book deals with the theory and application of associating a function of two variables with a function of two operators that do not commute. The concept of associating ordinary functions with operators has arisen in many areas of science and mathematics, and up to the beginning of the twentieth century many isolated results were obtained. These developments were mostly based on associating a function of one variable with one operator, the operator generally being the differentiation operator. With the discovery of quantum mechanics in the years 1925-1930, there arose, in a natural way, the issue that one has to associate a function of two variables with a function of two operators that do not commute. Methods to do so became known as

rules of association, correspondence rules, or ordering rules. This has led to a wonderfully rich mathematical development that has found applications in many fields. Subsequently it was realized that for every correspondence rule there is a corresponding phase-space distribution. Now the fields of correspondence rules and phase-space distributions are intimately connected. A similar development occurred in the field of time-frequency analysis where the aim is to understand signals with changing frequencies. The Weyl Operator and Its Generalization aims at bringing together the basic results of the field in a unified manner. A wide audience is addressed, particularly students and researchers who want to obtain an up-to-date working knowledge of the field. The mathematics is accessible to the uninitiated reader and is presented in a straightforward manner.

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