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	Sommario/riassunto	Deterministic simulation of the particle transport in semiconductor devices is an interesting alternative to the common Monte Carlo approach. In this book, a state-of-the-art technique called the multigroup approach is presented and applied to a variety of transport problems in bulk semiconductors and semiconductor devices. High-field effects as well as hot-phonon phenomena in polar semiconductors are studied in detail. The mathematical properties of the presented numerical method are studied, and the method is applied to simulating the transport of a two-dimensional electron gas formed at a s