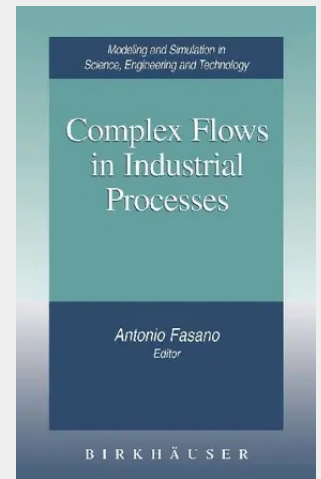


Complex Flows in Industrial Processes

Despite the fact that fluid dynamics and filtration through porous media and mathematics, there are classical research areas in engineering, physics, are still many industrial processes that require the study of new mathematical models for flows of particular complexity, due to the peculiar properties of the systems involved. The aim of this book is to provide a number of examples showing how frequently such situations arise in various branches of industrial technology. The selection of the subjects was motivated not only by their industrial relevance and mathematical interest. What I had in mind was a collection of problems having a really distinctive character, thus bringing some fresh air into one of the oldest and most revered domains of applied mathematics. The incredible richness of nonstandard flow problems in industrial applications has always been, and still is, a constant surprise to me. Therefore I tried to offer a very large spectrum of subjects, with special attention devoted to those problems in which the modeling phase is far from being obvious, and the mathematical content is absolutely nontrivial. With such a view to diversity, topics have been selected from a variety of sources (such as glass industry, polymers science, coffee brewing, fuels pipelining), and contributors from different backgrounds (mathematics, physics, chemical engineering) have been included. Consequently, the mathematical nature of the problems formulated spans over a large range, so that their theoretical investigation and numerical computation require a variety of different techniques.

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