Preface

Initiated from an original idea of Y. Maday in 1996, the CEMRACS is a yearly meeting for applied mathematicians interested in modeling and scientific computing. It is a special event of the SMAI, the French society for industrial and applied mathematics. Traditionally, the meeting is held at the Centre International de Rencontres Mathématiques (CIRM) on the campus of Luminy, Marseille. The eighth gathering was devoted to numerical methods for hyperbolic and kinetic problems.

The aim of the CEMRACS is two-fold. The first objective is to further fruitful interactions between academic laboratories and industrial centers of research. Secondly, the meeting provides a high level formation by offering a timely picture of a very active area in applied mathematics. Therefore, the CEMRACS aims at bringing together various groups of scientists: physicists, engineers, computer scientists, applied mathematicians, the combination of their skills and efforts being the condition of progress on the problems addressed by industrials. The applications include multi-phase flows, numerical resolution of plasma physics problems, simulations of non linear Schrödinger equations, diffusion approximation in radiative transfer.

The very heart of the CEMRACS is an intense research activity, organized by groups of two to six persons working together on the submitted subjects. Besides, the first week of the CEMRACS is devoted to lectures. This year the courses were given by Albert Cohen, Fréderic Coquel and Pierre Degond. These lectures survey the topics and offer the means to stay current with the cutting edges of the field.

More than one hundred people attended the summer school, with an average of fifty people present per week. This volume collects the progress performed during the summer school on the projects submitted by our industrial and academic partners.

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