

PREFACE

In June 4–9, 2005, the Second International Conference on Abstract and Applied Analysis was held at Quy Nhon, Vietnam. The conference brought together Vietnamese mathematicians working on analysis, as well as many distinguished foreign visitors. It covered all areas of analysis where Vietnamese mathematicians have been playing an active role, including pure and applied analysis, and deterministic and stochastic approaches. The proceedings of the conference are gathered in the present volume. The specific topics discussed at the conference reflect the most active research directions in Vietnam today, and as such, are quite varied. Seventeen papers appear here. For convenience, they have been loosely organized into four different chapters.

Chapter I, “Integral and Pseudodifferential Operators”, includes the papers where these operators play a major role, particularly in the theory of partial differential equations. The paper by Nguyen Minh Tri provides a criterion for the hypoellipticity for a class of operators with sign-changed characteristic form, generalizing earlier works of Beals and Fefferman. The paper by Nguyen Minh Chuong and Dang Anh Tuan deals with generalizations of the oblique derivative problem in several directions, including non-linear settings. The last two papers in the chapter deal more with the properties of the operators themselves, with the boundedness of commutator integrals of mixed homogeneity studied by Lubomira Softova, and a classification of integral transforms of both convolution and non-convolution types provided by Vu Kim Tuan.

Chapter II, “Partial Differential Equations”, deals of course also with partial differential equations, but with essentially different methods than the pseudodifferential and integral operator methods of Chapter I. The paper by Martin Schechter provides a unified min-max approach to variational problems, through the idea of linking sets separating a given functional. The paper by Mikio Tsuji and Peter Wagner studies generalized solutions

and the possible appearance of shock waves to a class of equations generalizing Burgers' equation. Boundary value problems for the biharmonic equation are studied in the paper by Dang Quang A and Le Tung Son, by a reduction to a boundary value problem for a second order equation, combined with an iterative scheme. A parabolic boundary value problem, arising from an inverse problem in engineering for finding the heating regime for a given desired final temperature, is studied in the paper by Dinh Nho Hao, Nguyen Trung Thanh, and H. Sahli, by the DC ("difference of two convex functions") method. The paper by Peter Massopust describes explicit solutions, in various coordinate systems, for the Maxwell equations describing magnetic fields generated by a hard ferromagnet. The paper by Ha Tien Ngoan and Nguyen Thi Nga deals with the local solvability of the non-characteristic Cauchy problem for weakly hyperbolic classical Monge-Ampere equations. The asymptotic analysis of the solutions of the Navier-Stokes problem is considered by Makram Hamouda and Roger Temam when the viscosity goes to zero and the flow in a channel of R^3 is also considered by them in the case when the boundary is non-characteristic.

Chapter III, "Geometric Analysis", groups together the papers with a more pronounced geometric flavor. The paper by Le Hong Van provides a construction of obstructions to imbedding a given statistical manifold into another one. A statistical manifold is a Riemannian manifold with an equivalence class of symmetric 3-tensors, a geometric concept which arises from information geometry. The paper by Do Ngoc Diep constructs a Z_2 -graded Cech cohomology, building in ideas of Rosenberg and Kontsevich from noncommutative geometry. The paper by Nguyen Minh Chuong and Le Duc Thinh studies Sobolev spaces with weights on Riemannian manifolds. Finally, as its title indicates, Chapter IV, "Stochastic and Infinite-Dimensional Analysis", groups together papers more related to either probability or analysis in infinite-dimensional spaces. They include the paper by Situ Rong, on the existence of solutions to some reflexive stochastic differential equations with jumps and its applications to stochastic population control; the paper by Shigeyoshi Ogawa, which provides a survey of developments related to a notion introduced by the author; the paper by Andrei Khrennikov, which discusses the foundations of quantum mechanics from the point of view of infinite-dimensional spaces, and the paper by Karl Gustafson, which discusses the ideas of the author on Bell's inequality and contraction semigroups.