

POLISH ACADEMY OF SCIENCES
INSTITUTE OF MATHEMATICS

**BANACH
CENTER**
Publications

VOLUME **33**

Stanisław Janeczko, Wojciech M. Zajączkowski
and Bogdan Ziemian (eds.)

**Singularities and
Differential Equations**

WARSZAWA 1996

SINGULARITIES AND DIFFERENTIAL EQUATIONS

Editors of the Volume

STANISŁAW JANECKO
WOJCIECH M. ZAJĄCZKOWSKI
BOGDAN ZIEMIAN

WARSZAWA 1996

PREFACE

The last years have seen an explosion of new concepts in singularity theory, which successfully penetrates semi- and sub-analytic geometry, symplectic geometry and the theory of partial differential equations. In all these areas similar fundamental ideas arose and the necessity to provide a common ground for interaction between them appeared naturally. The Symposium on Singularities and Differential Equations was aimed at stimulating development in these areas of mathematics. The Symposium was held at the Banach International Mathematical Center. It was organized into four workshops:

1. Topology of singularities
(organizers: J. W. Bruce, S. Lojasiewicz, D. Siersma, J.-C. Tougeron)
2. Singularities and symplectic geometry
(organizers: J. J. Duistermaat, S. Janeczko, T. Mostowski, V. Zakalyukin)
3. Geometric and analytical methods in partial differential equations
(organizers: I. S. Lychagin, A. Kaneko, W. Zajączkowski, G. Zampieri, B. Ziemian)
4. Singularities in microlocal analysis
(organizers: P. Schapira, B. Ziemian)

There were over 100 visitors participating in the Symposium and 80 seminars. The Symposium was partially supported by Max-Planck-Institut für Mathematik at Bonn and was successful owing to the very active organizers and the hard work of the staff of the Banach Center to whom we are very grateful.

*Stanisław Janeczko
Wojciech M. Zajączkowski
Bogdan Ziemian*

CONTENTS

N. ANDRÉ and M. CHIPOT, A remark on uniqueness for quasilinear elliptic equations	9–18
J.-P. BRASSELET, K.-H. FIESELER et L. KAUP, Caractérisation des variétés homologiques à l’aide des invariants d’homologie d’intersection	19–22
J. W. BRUCE and F. TARI, Implicit differential equations from the singularity theory viewpoint	23–38
J. W. CHOLEWA and T. DŁOTKO, Global solutions via partial information and the Cahn–Hilliard equation	39–50
W. DOMITRZ and S. JANECZKO, On Martinet’s singular symplectic structures	51–59
Yu. V. EGOROV, On a linear hyperbolic equation with smooth coefficients without solutions	61–66
M. FILA and J. FILO, Blow-up on the boundary: a survey	67–78
P. HAJŁASZ, A counterexample to the L^p -Hodge decomposition	79–83
N. HONDA, Regularity theorems for holonomic modules	85–91
G. ISHIKAWA, Transversalities for Lagrange singularities of isotropic mappings of corank one	93–104
R. ISHIMURA and Y. OKADA, The micro-support of the complex defined by a convolution operator in tube domains	105–114
N. M. IVOCHKINA, On the maximum principle for principal curvatures	115–126
S. IZUMIYA and G. T. KOSSIORIS, Formation of singularities for viscosity solutions of Hamilton–Jacobi equations	127–148
A. KANEKO, On the global solvability of linear partial differential equations with constant coefficients in the space of real analytic functions	149–160
M. È. KAZARIAN, Umbilical characteristic number of Lagrangian mappings of 3-dimensional pseudooptical manifolds	161–170
A. F. KÜNZLE, Singular Hamiltonian systems and symplectic capacities	171–187
E. LEINARTAS, On the Cauchy problem in a class of entire functions in several variables	189–192
H. A. LEVINE, A global existence–global nonexistence conjecture of Fujita type for a system of degenerate semilinear parabolic equations	193–198
G. M. LIEBERMAN, Study of global solutions of parabolic equations via <i>a priori</i> estimates III. Equations of p -Laplacian type	199–221
T. MONTEIRO FERNANDES, Some functorial properties of microlocalization for \mathcal{D} -modules	223–233
O. MYASNICHENKO, Singularities of wave fronts at the boundary between two media	235–244
A. NÉMETHI, Variation structures: results and open problems	245–257
O. NETO, Systems of meromorphic microdifferential equations	259–275
NGUYEN SÌ MINH and B. ZIEMIAN, A remark on Nilsson type integrals	277–285

T. OHMOTO, Thom polynomials for open Whitney umbrellas of isotropic mappings . . .	287–296
A. G. POPOV, Non-Euclidean geometry and differential equations	297–308
P. QUITTNER, Global existence of solutions of parabolic problems with nonlinear boundary conditions	309–314
T. SAKURAI, Analytic hypoellipticity and local solvability for a class of pseudo-differ- ential operators with symplectic characteristics	315–335
A. V. SAMOKHIN, Symmetries of control systems	337–342
S. STANCHENKO, Generic deformations of Lagrangian and Legendrian maps	343–349
B. STERNIN and V. SHATALOV, Asymptotic solutions to Fuchsian equations in several variables	351–363
G. STRÖHMER, A remark about a Galerkin method	365–367
G. STRÖHMER and W. ZAJĄCZKOWSKI, Existence and stability theorems for abstract parabolic equations, and some of their applications	369–382
P. STRZELECKI, Stationary p -harmonic maps into spheres	383–393
H. TAHARA, Removable singularities of solutions of nonlinear singular partial differen- tial equations	395–399
TA LÊ LOI, Whitney stratification of sets definable in the structure \mathbb{R}_{exp}	401–409
M. TIBĂR, A supplement to the Iomdin-Lê theorem for singularities with one-dimen- sional singular locus	411–419
J.-C. TOUGERON, Paramétrisations de petits chemins en géométrie analytique réelle . .	421–436
M. TSUJI, Extension of solutions for Monge–Ampère equations of hyperbolic type . .	437–447
F. J. TURIEL, Classification of (1,1) tensor fields and bihamiltonian structures	449–458
M. ZAJĄC, The Milnor number of functions on singular hypersurfaces	459–463
W. M. ZAJĄCZKOWSKI, L_∞ -estimate for solutions of nonlinear parabolic systems . . .	465–490
—, L_∞ -estimates for solutions of nonlinear parabolic systems with gradient linear growth	491–501