# MATHEMATICS

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## ON PARACOMPACTNESS INFINITE DIMENSIONAL MANIFOLDS

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*In the article the criterion of paracompactness of the infinite dimensional manifold M modeled in linear topological space L is proved. It is found that for paracompactness is necessary and sufficient to model space L has been regularly. The sufficient condition of existence of the smooth partition of unity on a smooth Banach manifold is established. It is demonstrated that this condition is not always the case.*

***Keywords:*** *infinite dimensional manifold, paracompactness, partition of unity.*

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## A CONSTRUCTION OF T-RESILIENT FUNCTIONS WITH HIGH NON LINEARITY BASED ON THE SPECIAL CLASS OF ALGEBRAIC-GEOMETRIC REED-SOLOMON TYPES CODES

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*The article presents the algorithm for constructing t-resilient Boolean mapping, based on Pasalic–Maitra and Camion–Canteaut approaches, using the special class of algebraic-geometric Reed–Solomon types codes in the plane projective curves over finite fields. The dependence of the resilient and nonlinearity obtained Boolean mappings chosen from the error-correcting codes is investigated. The common*

*practices for the use of a particular code are developed. The characteristics of some of the constructed mapping are compared with the previously well-known examples.*

***Keywords:*** *Boolean function, t-resilient, nonlinearly, error-correction codes, AG-codes, MDS-codes.*

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# ON PSEUDODIFFERENTIAL OPERATORS OF RADIAL TYPE

***2014 г. V.M. Deundyak, E.I. Miroshnikova***

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*New class of radial type pseudodifferential operators is introduced. The theorem on boundedness of these operators in the Sobolev type scales is prooved. For algebra generated by such operators with anisotropically radial slowly oscillated characteristics of zero order the relationship with classical pseudodifferential operators is established and the symbolic calculation is constracted. In terms of symbol for operators under investigation the Fredholm criterion is formulated.*

***Keywords:*** *pseudodifferential operator, Hermander class, Sobolev space, boundedness, Fredholm property, symbol.*

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# SOLVABILITY OF THE CAUCHY PROBLEM FOR CAHN–HILLIARD EQUATION WITH VISCOSITY IN SPACE OF THE UNIFORMLY

# CONTINUOUS LIMITED FUNCTIONS *

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*For the partial differential equation named in headline of the article, modeling the distribution of the concentration of one of the two components of binary viscous mixture, solvability of the Cauchy problem in the multidimensional Euclidean space is researched by reducing to the abstract Cauchy problem in Banach space. The period of time of existence of a classical solution of the Cauchy problem is found for the Cahn-Hilliard equation with a viscosity in the space of uniformly bounded continuous functions and an estimate of the solution is acquired.*

***Keywords:*** *Cahn–Hilliard equation with viscosity, strongly continuous semi-groups of operators.*

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