

**SOME CLASSES OF COMPLEX PARTIAL DIFFERENTIAL  
EQUATIONS OF SECOND ORDER WITH FUCHS OPERATOR  
IN THE MAIN PART AND BOUNDARY VALUE PROBLEMS  
FOR THEM**

DISSERTATION

des Fachbereichs Mathematik und Informatik  
der Freien Universität Berlin  
zur Erlangung des Grades eines  
Doktors der Naturwissenschaften

Erster Gutacher: Prof., Dr. H. Begehr  
Zweiter Gutachter: Prof., Dr. M. Otelbaev  
Dritten Gutachter: Prof., Dr. A. Tungatarov

Vorgelegt von  
Serik Altynbek  
April 2008

Date of Disputation: 30.May 2008

## Contents

Introduction.....	3
1. Chapter 1	
Construction of the variety of continuous solutions of second order partial differential equations in the plane with Fuchs operator in the main part.....	12
1.1. Model second order partial differential equations in the plane with Fuchs operator in the main part and specified right hand side.....	12
1.2. Nonhomogeneous model second order partial differential equations in the plane with Fuchs operator in the main part .....	22
1.3. Second order partial differential equations in the plane with Fuchs operator in the main part and specified right hand side .....	34
1.4. Nonhomogeneous second order partial differential equations in the plane with Fuchs operator in the main part.....	42
2. Chapter 2	
Boundary value problems for second order partial differential equations in the plane with Fuchs operator in the main part .....	47

2.1. Dirichlet and Neumann problems with given growth at infinity for a model second order partial differential equation in the plane with Fuchs operator in the main part and specified right hand side .....	47
2.2. Initial boundary problem for nonhomogeneous model second order partial differential equations in the plane with Fuchs operator in the main part. ....	61
2.3. Dirichlet problem with given growth at infinity for second order partial differential equations in the plane with Fuchs operator in the main part and specified right hand side .....	66
2.4. Dirichlet problem for nonhomogeneous second order partial differential equations in the plane with Fuchs operator in the main part. ....	70
Literature .....	73
Zusammenfassung	
Curriculum vitae	