

# Distributions, Fourier Transforms and Microlocal Analysis

Yu. Safarov, King's College, London

## Summary

Microlocal analysis is a relatively new approach to the study of differential operators which has led to remarkable achievements during the last 30 years. The main aim of the course is to introduce students to this actively developing subject and to enable them to understand the meaning of such concepts as 'fundamental solutions', 'wave front sets', 'propagation of singularities' and 'pseudodifferential operators'.

Microlocal analysis is based on Fourier analysis and the theory of distributions. These two classical subjects will be discussed in the first part of the course. The second part will be devoted to the technique of microlocal analysis and its applications to the theory of partial differential equations. The following topics will be covered:

(1) the Schwartz space  $\mathcal{S}$ , Fourier transform in  $\mathcal{S}$  and its elementary properties, the inversion formula; (2) the space of tempered distributions  $\mathcal{S}'$ , the basic properties of distributions; (3) partial differential equations with constant coefficients and their fundamental solutions; (4) oscillatory integrals and pseudodifferential operators; (5) singularities of solutions of partial differential equations.