Boundary problems and heat equations for fractional-order operators

Gerd Grubb*[1]

[1]University of Copenhagen – Denmark

Abstract

The fractional Laplacian (-Delta)ˆa where a in (0,1) and its generalizations to other pseudodifferential operators or singular integral operators of order 2a with even symbol resp. kernel, are currently of interest because of applications in probability and finance, as well as in mathematical physics and differential geometry. We shall give an account of how the Dirichlet problem on a bounded set in Rˆn is set up and solved, focusing on how the domain is described, by pseudodifferential methods. Here the a'th power of the distance to the boundary enters in an important way. Moreover, we report on recent results for the associated heat quation, where methods from differential operator cases can be applied to some extent, but there is a marked difference regarding regularity of solutions.

*Speaker