Global pseudodifferential operators

Mathematics Department, Potsdam University

We: 12:15-13:45 Room 1.08.0.53 (Lecture)
Fr: 8:15-9:45 Room 1.08.0.59 (Exercise session)

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Abstract

The course, which only requires some basic knowledge in analysis, aims at providing a friendly introduction to a cornerstone of analysis, pseudodifferential operators on manifolds, which play an fundamental role in geometry and physics. The course focuses on pseudodifferential operators acting either on $\mathbb{R}^n$ or on manifolds with symmetries such as the n-torus and more general compact Lie groups. Both cases allow for a global description which contrasts with the usual local description of pseudodifferential operators. We shall discuss the Wodzicki residue on polyhomogeneous global pseudodifferential operators, which proves to be a useful tool to measure discrepancies. Global pseudodifferential operators also have interesting geometric applications and generalisations which we plan to discuss if time allows.

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References

[N] F. Nicola, *Trace functionals for a class of pseudodifferential operators in* $\mathbb{R}^n$, Mathematical Physics, Analysis and Geometry 6 (2003) 89-105

[P] S. Paycha, *Sums, integrals and traces; an analytic point of view*, AMS University Lecture Series 59 (2013)

[NR] F. Nicola, L. Rodino, *Global pseudo-differential calculus on Euclidean spaces*, Birkäuser (2010)

[RT] M. Ruzhansky, V. Turunen, *Pseudo-differential operators and symmetries*, Birkäuser (2010)