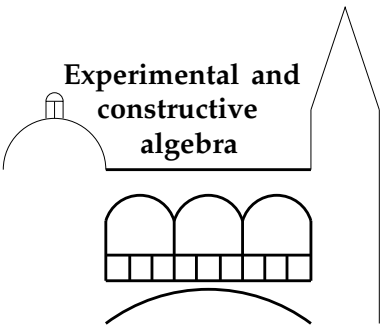
Graduiertenkolleg

Experimentelle und konstruktive Algebra



Kolloquiumsvortrag

Dienstag, 10. Juli 2018, 14:00 Uhr, Hörsaal V

Rene Koch (Lehrstuhl A für Mathematik):

Analysis of Shearlet Coorbit Spaces as Decomposition Spaces

Coorbit theory provides a framework for the study of approximation theoretic properties of certain function systems derived from the action of a group. For specific choices of groups, the associated coorbit spaces coincide with classical function spaces such as Besov spaces and allow the decomposition of their elements in terms of elementary building blocks. However, we can also define new function spaces, whose properties are not clear from the outset, by varying the group.

We consider coorbit spaces with respect to shearlet groups and study some of their properties by utilizing a recently established isomorphism of coorbit spaces with certain decomposition spaces. These groups receive attention because the derived system of building blocks is well suited for the approximation of functions with anisotropic features. Furthermore, this different decomposition space viewpoint enables us to compare coorbit spaces associated to different groups and to determine their embedding behavior into Sobolev spaces.

We first consider the three dimensional case and show how this identification of shearlet coorbit spaces with decomposition spaces can be applied, using a covering of a certain subset in $\mathbb{R}^3$ induced by the group. By comparing coverings induced by different groups, a rigidity result for decomposition spaces allows to conclude that different shearlet groups lead to different associated coorbit spaces.

A way around the explicit construction of induced coverings is provided by the language of coarse geometry. This allows to study the relation coverings induced by different groups have to each other by investigating the metric properties of a particular map between the groups. This language can then be applied to show that the prior result for the three dimensional case can be extended to all dimensions for two particular classes of shearlet groups.

Wir laden alle Interessierten herzlich ein.