

having a coffee in a Banach space makes you feel complete

Vortragsankündigung Institutsseminar

Wintersemester 2019/20

16:00 Uhr im Seminarraum, 7.122

14.11.2019 Prof. Dr. Elisabeth Larsson (Uppsala University)

Recent advances in radial basis function partition of unity methods

Abstract: Radial basis function (RBF) approximation methods were introduced in the context of scattered data interpolation. They have attractive theoretical properties such as guaranteed non-singularity of the interpolation matrix for multivariate approximations. When solving partial differential equations the scattered data property is instead used for dealing with non-trivial geometries without the need for a mesh. Using global approximation with globally supported RBFs leads to dense and ill-conditioned linear systems. The current trend is therefore to use localized approximations. The two main examples are RBF-generated finite difference methods (RBF-FD) and radial basis function partition of unity methods (RBF-PUM). In RBF-PUM, local RBF approximation on overlapping patches covering the computational domain are blended together using partition of unity weight functions. In this presentation, we show how the stability of RBF-PUM is improved by oversampling, we introduce an adaptive RBF-PUM scheme, and show results for application problems solved with RBF-PUM.

Alle Interessenten sind herzlich eingeladen!

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```
39 typedef Dune::ACFem::MassModel<EllipticModelType> MassModelType;
40 MassModelType bareMassModel(implicitEllipticModel);
41
42 auto massModel(mu * (mat.Z_a) * J + mat.Z_w) * bareMassModel);
```

$$\|U - u\|_W \sim \left(\sum_{E \in \mathcal{E}_g} \varepsilon_g(T; E) \right)^{1/2}$$

$$\partial_t u + \operatorname{div}_x f(u) = 0$$