A U S H A N G

FREIE UNIVERSITÄT BERLIN

Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

D I S P U T A T I O N

Donnerstag, 16. Juli 2015, 10.00 Uhr

Ort: Seminarraum 031, Arnimallee 6, 14195 Berlin

Disputation über die Doktorarbeit von

Frau Hanne Hardering

Thema der Dissertation:

Intrinsic Discretization Error Bounds for Geodesic Finite Elements

Thema der Disputation:

Stability of Discretizations of a Class of Mixed Variational Problems

Die Arbeit wurde unter der Betreuung von **Prof. Dr. R. Kornhuber** durchgeführt.

Abstract: The theory of finite element exterior calculus (FEEC) developed by Arnold, Falk, and Winther (2006, 2010) provides an abstract framework for the stability analysis for mixed finite element discretizations of linear PDEs that can be written as an abstract Hodge Laplacian of a closed Hilbert complex. Arnold, Falk, and Winther identify as key property for stability that the discretization spaces form a subcomplex of the continuous complex with a bounded cochain projection in between. Holst and Stern (2012) extend FEEC by weakening the subcomplex assumption, thus allowing non-conformity of the discretization methods. This in particular extends the theory to complexes on approximate domains. An application to surface finite elements for the Laplace-Beltrami operator then recovers the a priori estimates proven by Dziuk (1988) and Demlow (2009).

Although the theory of Hilbert complexes and Hodge theory was developed to analyze topological invariants such as Betti numbers, the aspects used to obtain the above framework can be explained in a rather elementary, non-topological way. The aim of this talk is to do just that.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
Prof. Dr. R. Kornhuber