ALPEN-ADRIA UNIVERSITÄT
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Institut für Mathematik

Einladung zu einem Vortrag
im Rahmen des DK-Seminars des Karl Popper Kollegs von

Prof.Dr. Bernd Hofmann
TU Chemnitz

zum Thema

Regularization and conditional stability: some case studies in a Hilbert space setting

Ort: I.2.00 (Sunset-Lounge) der Universität Klagenfurt
Zeit: Dienstag, 4. Juli 2017, um 9:00 Uhr

Kurzfassung:

For the stable approximate solution of linear and nonlinear ill-posed inverse problems, regularization approaches are required. Variational regularization of Tikhonov type characterizes the most prominent class of such methods, where a regularization parameter $\alpha > 0$ controls the trade-off between a data misfit term and a stabilizing penalty term. If the forward operator is monotone, the approach of singular perturbation (Lavrentiev regularization) applies as a simpler alternative to Tikhonov regularization. When the data are noisy with noise level $\delta > 0$, convergence of regularized solutions can be forced for standard situations in both methods when α tends to zero as $\delta \to 0$, but not too fast such that the quotient of δ and an appropriate power of α still tends to zero. However, these quotients should be kept constant under the assumption of a conditional stability estimate in order to prove convergence. For Tikhonov regularization with oversmoothing penalties these quotients must even tend to infinity. In this context, there are presented some case studies for Tikhonov and Lavrentiev regularization in a Hilbert space setting, referring to the phenomena of conditional stability and local ill-posedness. This talk presents joint work with Barbara Kaltenbacher and Elena Resmerita (Klagenfurt); Radu I. Boţ (Vienna); Peter Mathé (Berlin); Michael Hinze and Tran Nhan Tam Quyen (Hamburg). Research is partially supported by the Deutsche Forschungsgemeinschaft (DFG) under grant HO 1454/10-1.

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