



Der Wissenschaftsfonds.



## Einladung

zum Vortrag im Rahmen des **SFB Colloquiums** (Standort Linz), mit dem Titel

### **The first numerical method for multidimensional SDEs with discontinuous drift and degenerate diffusion**

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DATUM: Donnerstag, 12. Mai 2016

ZEIT: 14:30 Uhr

ORT: Science Park 2, SP2 416-1, JKU Linz

**Abstract:** When solving certain stochastic optimization problems, e.g., in mathematical finance, the optimal control policy is of threshold type, meaning that it depends on the controlled process in a discontinuous way. The stochastic differential equations (SDEs) modeling the underlying process then typically have discontinuous drift and degenerate diffusion parameter. This motivates the study of a more general class of such SDEs.

We prove an existence and uniqueness result, based on certain a transformation of the state space by which the drift is “made continuous”. As a consequence the transform becomes useful for the construction of a numerical method. The resulting scheme is proven to converge with strong order  $1/2$ . This is the first result of that kind for such a general class of SDEs.

We will first present the one-dimensional case and subsequently show how the ideas can be generalized to higher dimensions. We discuss the necessity of the geometric conditions we pose, and finally present an example, for which the drift of the SDE is discontinuous on the unit circle.

Joint work with G. Leobacher (JKU Linz).