



Der Wissenschaftsfonds.



JOHANN · RADON · INSTITUTE  
FOR COMPUTATIONAL AND APPLIED MATHEMATICS

## Einladung

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

# Applying the Multivariate Decomposition Method to an elliptic eigenproblem with a random coefficient

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DATUM: Montag, 22. August 2016

ZEIT: 13:30 Uhr

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

**Abstract:** The Multivariate Decomposition Method (MDM) is an algorithm for approximating the integral of a function which depends on infinitely-many variables. One such problem where infinite-variate integrands arise is an elliptic PDE with a random coefficient that can be parametrised by infinitely-many stochastic variables. In this talk we study the corresponding eigenproblem, and our quantity of interest is the expected value, with respect to the stochastic parameters, of the smallest eigenvalue. Since eigenvalues are not linear functionals they do not fit the existing framework for PDE source problems and to verify the conditions required for the application of the MDM algorithm we must study the regularity of eigenvalues with respect to the stochastic parameters. Furthermore, since the eigenvalues cannot be found analytically they will be approximated by the eigenvalues of a discretised finite element problem. This adds an extra approximation step to the MDM algorithm that must be accounted for. I will discuss applying the MDM when the integrand is the minimal eigenvalue of an elliptic eigenproblem with a random coefficient. I will briefly introduce the eigenproblem, the MDM algorithm including a finite element approximation, give a result on the regularity of certain eigenvalues and then give details on the implementation.