



## **Einladung zum Vortrag**

von

**Herrn Dr. Oliver Grothe**  
UNIVERSITÄT KÖLN

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### **Spatial Dependence Structures in Wind Forces: A Copula Based Analysis**

The investment decision where to install wind turbines is – neglecting legal formalities -- mainly driven by maximizing the expected annual energy production of single turbines. This results in a concentration of wind farms at locations with high average wind speed. While this strategy may be optimal for single investors maximizing their own return on investment, the resulting overall allocation of wind turbines may be unfavorable for the economy and energy suppliers. In particular, the intermittency of wind prevents a substantial contribution of wind energy to the baseload. Even worse, energy suppliers and load managers are forced to hold backup capacities in terms of spinning reserve and quick-start capabilities to smooth out fluctuations in the wind power output. This paper investigates to what extent optimal allocation of wind farms in Germany can reduce these fluctuations of wind energy. We analyze stochastic dependencies of wind speed for a huge dataset of German weather stations and find that these dependencies turn out to be highly nonlinear but constant over time. Using copula theory we determine the value at risk of energy production for given allocation sets of wind farms and derive optimal allocation plans with regard to different risk measures. We find that the controlled allocation of wind farms may substantially stabilize the overall wind energy supply.

**Termin: Freitag, 5. November 2010, 14:15 Uhr**

**Ort: Universität Ulm, Helmholtzstr. 18, Raum 220**

Der Vortrag findet im Rahmen des Graduiertenkolleg-Seminars statt. Interessenten sind herzlich eingeladen.

gez. V. Schmidt