

数学与系统科学研究院

计算数学所学术报告

报告人: **Prof. Volker John**

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Mathematics and Computer Science, Freie Universität Berlin*)

报告题目:

**Variational Multiscale (VMS)
Methods for the Simulation of
Turbulent Incompressible Flows**

邀请人: 袁礼 研究员

报告时间: **2017 年 5 月 10 日 (周三)**

上午 10:00-11:00

报告地点: **数学院南楼六层**

602 教室

Abstract:

VMS methods are a comparably new class of methods for simulating turbulent incompressible flows. The talk will start with an introduction to the difficulties of turbulent flow simulations. Next, principal ideas of the classical Large Eddy Simulation (LES) approach will be presented. Then, the basic ideas of VMS methods will be discussed, together with highlighting the differences to LES methods. Various realizations of VMS methods for simulating turbulent incompressible flows have been proposed in the past fifteen years. All of these realizations obey the basic principles of VMS methods: They are based on the variational formulation of the equations and the scale separation is defined by projections. However, apart from these common basic features, various VMS methods look quite different. In this talk, the derivation of the different VMS methods is presented in some detail, their relations among each other and their behavior in numerical simulations are discussed.

报告人简介:

1997 PhD Univ. of Magdeburg, 2009 full professor Freie Univeristät Berlin and head of group 'Numerical Mathematics and Scientific Computing' of Weierstrass Institute (WIAS) Berlin.

Main research topics:

finite element methods for convection-dominated equations and incompressible flow problems: numerical analysis, development, applications (turbulence modeling); 2 monographs, around 90 journal papers.

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