数学与系统科学研究院

计算数学所学术报告

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报告题目：

Parallel Domain Decomposition Preconditioners for Large-scale Patient-specific Blood Flow Simulations

邀请人： 黄记祖 副研究员

报告时间：2019 年 6 月 12 日（周三）

下午 16:30-17:30

报告地点： 数学院南楼七层

702 教室

Abstract：

Numerical simulation of blood flows in compliant arteries based on patient-specific geometry and parameters can be clinically helpful for physicians or researchers to study vascular diseases, to enhance diagnoses, as well as to plan surgery procedures. In this talk, we will discuss some scalable parallel domain decomposition preconditioners for the simulation of blood flow in compliant arteries on large scale supercomputers. The blood flow is modeled by 3D unsteady incompressible Navier-Stokes equations with a lumped parameter boundary condition, which are discretized with a stabilized finite element based on unstructured meshes in space and a fully implicit method in time. The large scale discretized nonlinear systems are solved by a parallel Newton-Krylov method preconditioned by linear and nonlinear domain decomposition preconditioners. Several mathematical, biomechanical, and supercomputing issues will be discussed in detail, and some numerical experiments for patient-specific arteries will be presented. We will also report the parallel performance of the methods on a supercomputer with a large number of processors.

欢迎大家参加！