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：

(1). A Global and Local Field Method For Solving Differential Equation

(2). The GL Forward and Metro Carlo Inversion Method In Electromagnetic, Elastic and Nano-Materials

Abstract:

(1). We propose a new Global and Local Field Method for solving ordinary and partial differential equations, in which the equations are held on an

infinite domain which includes a finite inhomogeneous domain. The inhomogeneous domain is divided into several sub domains. We present the solution of the differential equation as an explicit recursive sum of the integrals in the inhomogeneous sub domains. The analytical solution of the equation in the infinite homogeneous domain is called as an initial global field. The global field is updated successively by local scattering field when each sub domain is scanned. Once all the sub domains are scanned, the solution of the equation is obtained. We call our method as Global and Local field method, in short GL method. It is different from FEM method, the GL method directly assemble inverse matrix and solution. There is no big matrix equation needs to solve in the GL method. There is no needed artificial boundary and no absorption boundary condition for infinite domain in the GL method. The error estimation of the GL method for solving 1D wave equation is presented. The simulations show that the GL method is accurate, fast, and stable for solving elliptic, parabolic, and hyperbolic equations.

(2). In this talking, we present the GL Forward and A GL Metro Carlo Inversion Method in Elastic, Electromagnetic and Nano- materials. The GL Metro Carlo (GLMC) inversion is a compromising method between the deterministic and random Monte Carlo simulation methods. The GL modeling strategy simulation process is used to construct the GLMC inversion. Our GL EM modeling method is very fast to calculate data when the parameters are changed in each one sub domain successively, that merit accelerates the GLMC inversion. The GLMC inversion method can be used to recover the electromagnetic, elastic, and nao materials parameters and for their coupled inversion.

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上午10:00—11:30

报告地点： 科技综合楼三层311

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