Computational Mathematics Seminar Series

A Balancing Domain Decomposition Method by Constraints for Raviart-Thomas Vector Fields

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Johnston Hall 338
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Abstract:

Balancing domain decomposition by constraints(BDDC) preconditioners consist of a coarse component, involving primal constraints across the interface between the subdomains, and local components related to the Schur complements of the local subdomain problems. A BDDC method for vector field problems discretized with Raviart-Thomas finite elements is introduced. The method is based on a new type of weighted averages developed to deal with more than one variable coefficient. Bounds on the condition number of the preconditioned linear system are also provided and the estimated condition number is quite insensitive to the values and jumps of the coefficients across the interface and has a polylogarithmic bound in terms of the number of degrees of freedom in the individual subdomains. Numerical experiments for 2D and 3D problems, which support the theory and show the effectiveness of our algorithm, are also presented.

Speaker's Bio:

Duk-Soon Oh is an incoming postdoc at CCT. He completed his Ph.D degree in Mathematics at Courant Institute of Mathematical Sciences of New York University in September 2011. Before he came to LSU, he was an assistant research scientist at the same institute.

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