APPLIED MATHEMATICS COLLOQUIUM

On the Solution of Elliptic Partial Differential Equations on Regions with Corners, Edges, and Conical Points

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Abstract: The solution of elliptic partial differential equations on regions with non-smooth boundaries (edges, corners, etc.) is a notoriously refractory problem. In this talk, I observe that when the problems are formulated as boundary integral equations of classical potential theory, the solutions (of the integral equations) in the vicinity of corners are representable by series of elementary functions. In addition to being analytically perspicuous, the resulting expressions lend themselves to the construction of accurate and efficient numerical algorithms. The results are illustrated by a number of numerical examples.

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Applied Math Colloquium: https://math.mit.edu/amc/fall18/
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