

On the solution of the biharmonic equation on regions with corners

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In this talk, I will discuss the numerical solution of the biharmonic equation on regions with corners. Historically, this has been a somewhat refractory class of problems, in part due to the complicated behavior of the corresponding Green's functions. We show that, when the biharmonic equation is reformulated as a pair of coupled integral equations on the boundary, the solutions are representable by rapidly convergent series of elementary functions which oscillate with frequency proportional to the logarithm of the distance from the corner. Such representations are constructed explicitly and are used to create highly accurate and efficient Nyström discretizations, significantly reducing the number of degrees of freedom required for solving the corresponding integral equations; the condition numbers of the resulting systems of linear