Meshfree Particle Methods for Thin Plates

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Abstract

For thin plate problems, using the Kirchoff hypothesis, the three dimensional elasticity equations are reduced to a fourth order PDE for the vertical displacement. Conventional FEM has difficulties with this because the basis functions are required to have continuous partial derivatives. Meshfree methods have the advantage of constructing smooth approximation functions, but have difficulties in imposing essential boundary conditions. In this talk, using a partition of unity, a meshfree method is introduced that has high order polynomial reproducing property and satisfies the Kronecker delta property along the boundary. This method is then tested and results are presented.