

## **A coupled ES-FEM/SBFEM method for unbounded potential flow problems**

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The edge-based smoothed finite element method (ES-FEM) developed recently shows some excellent features in solving solid mechanics using triangular mesh. However, like the finite element method, it does not handle unbounded problems well. The scaled boundary finite element method (SBFEM) is semi-analytical in the sense that it assumes a strong form in the radial direction and a weak form in the circumferential direction. It has the inherent advantage of solving unbounded problems. In this paper, a coupled ES-FEM/SBFEM method is proposed to analyze unbounded potential flow problems. The validity and efficiency of the ES-FEM/SBFEM method are demonstrated through a number of examples. It is found that the present method can take the full advantages of both ES-FEM and SBFEM methods.

**Keywords:** Potential flow, ES-FEM, SBFEM, Unbounded domains, Semi-analytical