

Accurate Methods and Engineering Applications

Abstract

Nodal and modal spectral element and compact methods are used to obtain solutions for engineering problems such as particle-fluid interactions in two-phase flows, sediment particles transport/entrainment in shear flows, and drag resistance induced by vegetation stems (to be simulated as bendable cylinders) for flood risk reduction in wetlands along the coast. In addition, modified Boussinesq equations simulating nonlinear water waves in coastal and environmental engineering are solved with a high order compact method. The accuracy of results is demonstrated and the efficiency of methods is discussed.