1116-76-1359 **Chaoxu Pei*** (cpei@math.fsu.edu), **Mark Sussman** and **M.Yousuff Hussaini**. *A Space-Time Discontinuous Galerkin Spectral Element Method for the Stefan Problem.*

The Stefan problem is a moving boundary problem that is used to model phase change. It requires solving the heat equations for different phases, i.e. the ice and water phases, while the phase boundary separating the two phases is transported with a velocity that is proportional to the jump of the normal heat flux at the evolving and prior unknown boundary. In other words, the problem requires one to find the solutions in a prior unknown domain and to compute the shape of the unknown domain as a part of the solution. We propose a novel space-time discontinuous Galerkin spectral element method for solving the Stefan problem. Two transformations are introduced to deal with the prior unknown time evolving phase boundary, which combines an Eulerian description with a Lagrangian description. Benchmark tests in one spatial dimension indicate that the method converges with spectral accuracy in both space and time for both the temperature distribution and the interface velocity. (Received September 18, 2015)