1092-65-125   **Youngjoon Hong*** (`hongy@indiana.edu`), 831 E. Third St., Bloomington, IN 47405, **Chang-Yeol Jung** (`cjung@unist.ac.kr`), Department of Mathematical Sciences, School of Natural Science, UNIST-gil 50, Ulsan, 689-798, South Korea, and **Roger Temam** (`temam@indiana.edu`), 831 E. Third St., Bloomington, IN 47405. *The numerical approach of the singularly perturbed problems.*

In this talk, I will present the numerical solutions of singularly perturbed problems in a circular domain and provide as well approximation schemes, error estimates and numerical simulations. To resolve the oscillations of classical numerical solutions due to the stiffness of our problem, we construct, via boundary layer analysis, the so-called boundary layer elements which absorb the boundary layer singularities. Using a P1 classical finite element space enriched with the boundary layer elements, we obtain an accurate numerical scheme in a quasi-uniform mesh. The talk includes a joint work with C.-Y. Jung and R. Temam. (Received August 05, 2013)

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