1067-35-548 **Jianxin Zhou*** (jzhou@math.tamu.edu), Department of Mathematics, Texas A&M University, College Station, TX 77843, **Ziqing Xie**, College of Mathematics and Computer Sciences, Hunan Normal University, Changsha, Hunan 410081, Peoples Rep of China, and **Yongjun Yuan**, College of Mathematics and Computer Sciences, Hunan Normal University, Changsha, Hunan 410081, Peoples Rep of China. *On finding multiple solutions to a singularly perturbed Neumann problem.*

In this talk, a modified local minimax method with new strategies is presented to numerically solve for multiple positive solutions to a singularly perturbed Neumann problem. Algorithm convergence and other related properties are verified. Motivated and convinced by new numerical results, the critical perturbation value is analytically verified, which closes a gap left in the literature for estimating such a value. Some interesting numerical results are displayed by their mesh profiles to illustrate the theory and method. (Received September 09, 2010)