1006-65-242 **Hong Xiao***, Dept. of Mathematics, UCD, One Shields Ave, Davis, CA 95616. *High Order Polynomial-based Quadratures on Two Dimensional Structures.*

We present polynomial-based quadratures on two dimensional domains. Similar to the Gaussian rules on intervals in R^1, quadratures in this paper possess such desirable features as rapid convergence, positvity of weights and symmetry. By using a continuation-type method, we have obtained quadratures in R^2 up to the 50th order. The resulting rules often use a minimum number of nodes, or a number of nodes close to minimum. The procedure used in the construction of quadratures is easily extended to the construction of quadratures on other structures in R^2 and structures in higher dimensions, as well as to integration of arbitrary functions on these structures. In this talk, we present examples of quadratures on triangles and squares, and relevant numerical results. (Received February 15, 2005)