Meeting: 1004, Bowling Green, Kentucky, SS 1A, Special Session on Numerical Analysis, Approximation, and Computational Complexity: Interdisciplinary Aspects

1004-65-150 **Andrew J Worsey*** (ajworsey@mtsu.edu), Dept. of Mathematical Sciences, Middle Tennessee State University, Murfreesboro, TN 37132, and **Tanya Sorokina**. *Multivariate C^1 Piecewise Quadratic Interpolation Schemes.*

We consider the problem of constructing a C^1 piecewise quadratic interpolant, Q, to positional and gradient data defined at the vertices of a tessellation of n-simplices in $\Re^n$.

The key to the interpolation process is to appropriately subdivide each domain simplex to ensure that certain necessary geometric constraints are satisfied by the subdivision points. We establish these constraints using the Bernstein-Bézier form for polynomials defined over simplices, and show how they might be satisfied in general. Most importantly, we show how to satisfy the constraints when the data sites form a regular lattice, which is often the case in practical applications. Two different schemes are presented for this situation, and we show that the resulting interpolant Q has full approximation power. (Received January 23, 2005)