1035-41-1480   **Ben N. Kamau*** (`bkamau@desu.edu`), Department of Mathematics, Delaware State University, 1200 N. DuPont Highway, Dover, DE 19901. *The Dimension of the Space of Smooth Splines of Degree 8 on Tetrahedral Partitions.*

Multivariate splines are piecewise polynomial functions in several variables defined on a simplicial complex in $\mathbf{R}^n$.

The dimension results of spaces of multivariate splines of smoothness r and degree $k \geq 2^n r + 1$ on any simplicial complex are known. Also known is a formula for the generic dimensions of spaces of splines of degree $k \geq 8$ defined on a simplicial complex in $\mathbf{R}^3$.

We study the dimension problem of higher-dimensional spline spaces defined on tetrahedral partitions. By Interpolation Conformality and Bernstein-Bézier techniques, we analyse the structure and dimensions of these spaces.

In this work we establish the dimension formula of spaces of trivariate C^1 smooth splines of degree 8 defined on general tetrahedral partitions. (Received September 20, 2007)