1041-52-161 **Tamon Stephen*** (tamon@sfu.ca), Department of Mathematics, Simon Fraser University, Surrey, B.C. V3M 0A3, Canada. *Colourful Simplicial Depth.*

The simplicial depth of a point p in $\mathbb{R}^d$ with respect to a finite set S of points is the number of $d+1$-sets from S whose convex hull contains p. In statistics, this is a measure of how well p represents S.

A natural generalization is to colour the points of S and consider only the colourful simplices containing p. We exhibit a configuration where p is in the convex hull of each of $d+1$ colours, but is only in d^2+1 colourful simplices. We conjecture that this is minimal and prove a quadratic lower bound. This result sharpens Bárány's Colourful Carathéodory Theorem, and gives an improved lower bound for monochrome simplicial depth. (Received August 09, 2008)