Estimation of a convex support function using regression splines

Mary C. Meyer* **and Johan Seger**

Department of Statistics, Colorado State University

Université Catholique de Louvain, Belgium

E-Mail: marycmeyer@gmail.com

Abstract: Estimation of a convex set given noisy measurements of the support function is accomplished using regression splines with shape constraints. The problem in formulated in terms of a projection onto a convex cone and rates of convergence are obtained. A test statistic is derived for the null hypothesis that the convex set is a circle, and it is shown that its distribution under the null is that of a mixture of beta random variables.