Letter to the Editor

A Remark on B-Splines

Marsden [3] has defined a Tchebycheffian spline (T-spline) approximation method, generalizing a polynomial spline approximation method first defined by Schoenberg [4], and derived some of its properties. In this connection, he stated that "it is probable" that the method is variation-diminishing.

We wish to point out that, in Ref. [2], we defined a similar T-spline approximation method and showed that it is variation-diminishing. The proof is based on the total positivity of the basic spline function (B-splines); see Ref. [1, Chap. 10].

Marsden used a different set of B-splines which, aside from positive constants, are the fundamental solution kernels, defined in Ref. [1, Chap. 10]. Since these kernels form a totally-positive set, Marsden's T-spline method is indeed variation-diminishing.

REFERENCES

1. S. KARLIN, "Total Positivity," Stanford University Press, Stanford, California, 1968.
2. S. KARLIN AND J. M. KARON, A variation-diminishing generalized spline approximation method, J. Approximation Theory 1 (1968), 255–268.
3. M. J. MARSDEN, An identity for spline functions with applications to variation-diminishing spline approximation, J. Approximation Theory 3 (1970), 7–49.
4. I. J. SCHOENBERG, On spline functions, in "Inequalities," Proceedings of a Symposium at Wright-Patterson Air Force Base (O. Shisha, Ed.), pp. 255–291, Academic Press, New York, 1967.

SAMUEL KARLIN

Department of Mathematics, Stanford University,
Stanford, California 94305

JOHN KARON

Department of Mathematics, Syracuse University,
Syracuse, New York 13210