

Comment on "Stochastic Interpolation of Rainfall Data From Rain Gages and Radar Using Cokriging, 1, Design of Experiments," and "2, Results," by Dong-Jun Seo et al.

DONALD E. MYERS

Department of Mathematics, University of Arizona, Tucson

The papers by Seo et al. [1990a, b] are an interesting application of cokriging and the authors are to be commended for that application. However, one of the important obligations of authors and of referees is to discern the extent to which the results are new and to ensure that relevant literature is cited. Unfortunately, these papers failed significantly in acknowledging prior work. Specifically, the development of cokriging, including universal and disjunctive cokriging, is presented as new work whereas it had already been in print for some time before this paper. In particular, see Myers [1982, 1983, 1984, 1985, 1988a, b, c, 1989], Carr et al. [1985, 1987], and Carr and Myers [1984, 1985]. Not one of these papers is cited. *Mathematical Geology* is one of the principal journals publishing geostatistical papers, yet there is only one citation to a paper in *Mathematical Geology* (and that one is unrelated to cokriging), there are no citations to papers in the proceedings from the second international conference on geostatistics (Lake Tahoe, 1983) or the third conference (Avignon 1988). These are significant publications for geostatistics; both authors and reviewers should be aware of them.

More specifically, the complete development of the general form of the cokriging estimator including the case of universal cokriging was already given by Myers [1982]. Various additional details were given in other papers listed above. The general case of disjunctive cokriging was given by Myers [1988c]. The authors have only given much more limited results; in particular, they have only considered the case of the estimation of one variable. However, the equations for this special case are not really different (or simpler) from the general case, and an emphasis on the one-variable case obscures important aspects of the development, specifically, the appropriate positive definiteness conditions for the matrix-valued spatial correlation function.

Neither paper acknowledges that a general cokriging program was published in *Computers and Geosciences* in 1985. There are a number of other relevant papers in that same journal.

REFERENCES

- Carr, J., and D. E. Myers, Application of the theory of regionalized variables to the spatial analysis of Landsat data, in *Proceedings of the Ninth Pecora Symposium on Remote Sensing*, pp. 55–61, IEEE Computer Society Press, Silver Spring, Md., 1984.
- Carr, J., and D. E. Myers, COSIM: A FORTRAN IV program for co-conditional simulation, *Comput. Geosci.*, 11(6), 675–705, 1985.
- Carr, J., D. E. Myers, and C. Glass, Co-kriging: A computer program, *Comput. Geosci.*, 11, 111–127, 1985.
- Carr, J., C. Glass, H. Yang, and D. E. Myers, Application of spatial statistics to analyzing multiple remote sensing data sets, *Geotechnical Applications of Remote Sensing and Remote Data Transmission, ASTM Spec. Tech. Publ. STP*, 967, 138–150, 1987.
- Myers, D. E., Matrix formulation of cokriging, *Math. Geol.*, 14(3), 249–257, 1982.
- Myers, D. E., Estimation of linear combinations and cokriging, *Math. Geol.*, 15(5), 633–637, 1983.
- Myers, D. E., Cokriging: New developments, in *Geostatistics for Natural Resource Characterization*, edited by G. Verly, M. David, A. G. Journel, and A. Marechal, pp. 295–305, D. Reidel, Hingham, Mass., 1984.
- Myers, D. E., Co-kriging: Methods and alternatives, in *The Role of Data in Scientific Progress*, edited by P. Glaeser, pp. 425–428, Elsevier Science, New York, 1985.
- Myers, D. E., Multivariate geostatistics for environmental monitoring, *Sci. Terre Inf. Geol.*, 27, 411–427, 1988a.
- Myers, D. E., Interpolation with positive definite functions, *Sci. Terre Inf. Geol.*, 28, 251–265, 1988b.
- Myers, D. E., Some aspects of multivariate analysis, in *Quantitative Analysis of Mineral and Energy Resources*, edited by C. F. Chung et al., pp. 669–687, D. Reidel, Hingham, Mass., 1988c.
- Myers, D. E., Vector conditional simulation, in *Geostatistics*, edited by M. Armstrong, pp. 283–293, D. Reidel, Hingham, Mass., 1989.
- Myers, D. E., and J. Carr, Cokriging and principal component analysis: Bentonite data revisited, *Sci. Terre Inf. Geol.*, 21, 65–77, 1985.
- Seo, D.-J., W. F. Krajewski, and D. S. Bowles, Stochastic interpolation of rainfall data from rain gages and radar using cokriging, 1, Design of experiments, *Water Resour. Res.*, 26(3), 469–477, 1990a.
- Seo, D.-J., W. F. Krajewski, A. Azimi-Zonooz, and D. S. Bowles, Stochastic interpolation of rainfall data from rain gages and radar using cokriging, 2, Results, *Water Resour. Res.*, 26(5), 915–924, 1990b.
- D. E. Myers, Department of Mathematics, University of Arizona, Tucson, AZ 85721.

(Received September 25, 1991;
revised December 10, 1991;
accepted December 30, 1991.)