

AIAA 82-4270

Reply by Authors to B. Prasad

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IN his Comment on Ref. 1, Prasad has compared operation counts involved in using an approximate Hessian in Refs. 2-5 with use of an exact Hessian in Ref. 1. This comparison is invalid as exact second order methods are compared with approximate methods. Approximate methods to evaluate the Hessian (such as quasi-Newton updates) can be used with the approach in Ref. 1. Also, operation counts cannot be solely

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used to compare methods that use exact Hessians with methods that use approximate Hessians, since former methods may lead to faster convergence. Furthermore, Ref. 1 presents a general framework for interior/exterior penalty functions and multiplier methods, while Refs. 2-5 deal only with (extended) interior penalty methods.

References

¹Belegundu, A. D. and Arora, J. S., "Potential of Transformation Methods in Optimal Design," *AIAA Journal*, Vol. 19, Oct. 1981, pp. 1372-1374.

²Prasad, B. and Haftka, R. T., "A Cubic Extended Interior Penalty Function for Structural Optimization," *International Journal for Numerical Methods in Engineering*, Vol. 14, No. 9, 1979, pp. 1107-1126.

³Haftka, R. T. and Starnes, J. H., "Application of a Quadratic Extended Interior Penalty Function for Structural Optimization," *AIAA Journal*, Vol. 14, June 1976, pp. 718-724.

⁴Prasad, B., "Variable Penalty Methods for Constrained Minimization," *Internal Journal of Computers and Mathematics with Applications*, Vol. 6, No. 1, 1980, pp. 79-97.

⁵Prasad, B., "A Generalized Class of Variable Penalty Methods for Nonlinear Programming," *Journal of Optimization Theory and Applications*, Vol. 35, Oct. 1981, pp. 159-182.

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Comment on "A Review of Research on Subsonic Turbulent Flow Attachment"

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RECENTLY, Eaton and Johnston reviewed research on subsonic turbulent flow reattachment.¹ In none of the

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experiments cited were wall pressure fluctuations measured under the shear layer. This is unfortunate because wall pressure fluctuations provide valuable insight into the structure of the shear layer and are of direct interest to aeronautical engineers. The measurement of wall pressure fluctuations should be considered as an additional recommendation for future work.

The strong similarity between the general shape of the maximum Reynolds shear stress through the reattachment region (Ref. 1, Fig. 8) and the corresponding pressure fluctuations measured in other experiments² should be noted.

References

¹Eaton, J. K. and Johnston, J. P., "A Review of Research on Subsonic Turbulent Flow Attachment," *AIAA Journal*, Vol. 19, Sept. 1981, pp. 1093-1100.

²Mabey, D. G., "Analysis and Correlation of Data on Pressure Fluctuations in Separated Flow," *AIAA Journal*, Vol. 10, Sept. 1972, p. 642.