Discussion

Comments on "A variable order approach to improve differential quadrature accuracy in dynamic analysis"

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Dr. Zong is to be congratulated for his thorough analysis of the sources of numerical instability in the DQ method and his proposal of a variable order approach that consists of applying different DQ schemes to the grid points near the boundaries and grid points located rather far from them [1]. Of particular importance is his treatment of scalar combustion models and his analysis of a forced vibrations situation.

On the other hand and concerning this last problem, it would have been of great interest if the author had computed stress resultants, e.g. bending moments, since this requires obtaining second-order derivatives of the displacement function, and comparing them with the exact solution as it was done in Ref. [2]. In this way, one could analyze the relative accuracy of the derivatives of the displacement function.

The writers feel that the differential quadrature method first proposed by Bellman and coworkers and to which Professor Charles Bert and associates have greatly contributed may lead to other highly important investigations such as the one performed by Z. Zong.

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References

[1] Z. Zong, A variable order approach to improve differential quadrature accuracy in dynamic analysis, *Journal of Sound and Vibration* 266 (2003) 307–323.

[2] R.H. Gutierrez, P.A.A. Laura, R.E. Rossi, The method of differential quadrature. Its application to the approximate solution of ocean engineering problems, *Ocean Engineering* 21 (1994) 57–66.