

³Leschziner, M. A., "Comment on 'New Eddy Viscosity Model for Computation of Swirling Turbulent Flows,'" *AIAA Journal*, Vol. 27, No. 9, 1989, p. 1036.

⁴Kim, K. Y., and Chung, M. K., "Reply by Authors to F. B. Gessner and M. A. Leschziner," *AIAA Journal*, Vol. 27, No. 9, 1989, p. 1036.

⁵Rodi, W., "A New Algebraic Relation for Calculating the Reynolds Stresses," *Zeitschrift für Angewandte Mathematik und Mechanik*, Vol. 56, 1976, pp. T219-T221.

⁶Gibson, M. M., and Launder, B. E., "Ground Effects on Pressure Fluctuations in the Atmospheric Boundary Layer," *Journal of Fluid Mechanics*, Vol. 86, Pt. 3, 1978, pp. 491-511.

⁷Gibson, M. M., and Younis, B. A., "Calculation of Swirling Jets with a Reynolds Stress Closure," *Physics of Fluids*, Vol. 29, No. 1, 1986, pp. 38-48.

⁸Gibson, M. M., and Launder, B. E., "On the Calculation of Horizontal Turbulent, Free Shear Flows Under Gravitational Influence," *Journal of Heat Transfer*, Feb. 1976, pp. 81-87.

Reply by Authors to G. C. Cheng

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THIS is a reply to G. C. Cheng who raised an inconsistency problem between model constants discussed in our reply¹ to previous comments by Gessner² and Leschziner³ on the new eddy viscosity model for computation of swirling turbulent flows.⁴

Our eddy viscosity model [Eq. (4) of Cheng's comment] had been derived from algebraic stress equations⁵ by introducing a number of rather crude assumptions [Eq. (5) in Ref. 4] for weakly swirling flows. Therefore, the relations between constants should not be considered as serious ones. They only guide us to determine approximate ranges of the model constants, α and β . Consequently, α and β must be inevitably adjusted in the feasible ranges permitted by the relations. As was shown in Ref. 4, the feasible ranges of α and β are $0.06 \leq \alpha \leq 0.14$ and $0.05 \leq \beta \leq 0.44$ under the local equilibrium condition $P = \epsilon$. Here, $\alpha = 0.09$ was taken to be consistent with the asymptotic case of the eddy viscosity coefficient for $R_i = 0$, and $\beta = 0.25$ was chosen as an average value within the range.

References

¹Kim, K. Y., and Chung, M. K., "Reply by Authors to F. B. Gessner and M. A. Leschziner," *AIAA Journal*, Vol. 27, No. 9, 1989, p. 1036.

²Gessner, P. B., "Comment on 'New Eddy Viscosity Model for Computation of Swirling Turbulent Flows,'" *AIAA Journal*, Vol. 27, No. 9, 1989, pp. 1035-1036.

³Leschziner, M. A., "Comment on 'New Eddy Viscosity Model for Computation of Swirling Turbulent Flows,'" *AIAA Journal*, Vol. 27, No. 9, 1989, p. 1036.

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⁴Kim, K. Y., and Chung, M. K., "New Eddy Viscosity Model for Computation of Swirling Turbulent Flows," *AIAA Journal*, Vol. 25, No. 7, 1987, pp. 1020-1022.

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Errata

Compatibility Conditions of Structural Mechanics for Finite Element Analysis

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AUTHORS S. N. Patnaik and L. Berke were inadvertently omitted from the title of this article because a correction was improperly applied to the title page. The Journal editorial department accepts full responsibility for this error and extends their apologies to the authors. Please note that their names appeared correctly in the Table of Contents and that they will be indexed correctly in the December 1991 issue of the Journal. Corrected reprints of this article are available from the authors.

Cell Centered and Cell Vertex Multigrid Schemes for the Navier-Stokes Equations

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THE following revised table should replace the one published on page 702 of this article:

Table 1 Mesh parameters

Grid	$\Delta y_{\min}$	Δx_{te}	Δs_{te}	$\Delta x_{x=0.5c}$	SF
193 × 33	2.25×10^{-5}	5.20×10^{-3}	3.25×10^{-3}	1.39×10^{-2}	1.56
385 × 65	1.00×10^{-5}	2.46×10^{-3}	1.57×10^{-3}	7.13×10^{-3}	1.25
577 × 97	6.67×10^{-6}	1.64×10^{-3}	1.04×10^{-3}	4.78×10^{-3}	1.16