

## SHORT COMMUNICATION

# Comments on ‘Simplex space–time meshes in finite element simulations’

Tayfun E. Tezduyar<sup>\*,†</sup>

*Mechanical Engineering, Rice University – MS 321, 6100 Main Street, Houston, TX 77005, U.S.A.*

### SUMMARY

Some comments are provided on the citations offered in a recent paper (M. Behr, *Int. J. Numer. Meth. Fluids* 2008; **57**:1421–1434) that describes space–time finite element computations of advection of ‘Gaussian hills’, including computations with mesh refinement in the time direction. Copyright © 2008 John Wiley & Sons, Ltd.

Received 12 August 2008; Revised 21 August 2008; Accepted 25 August 2008

KEY WORDS: space–time; EDSTT; EDSTT-single-mesh; EDSTT-multi-mesh; advection; Cosine hill

It is stated in Section 1.3 that a ‘multiple mesh’ space–time approach was proposed in a PhD thesis (Reference 17 in the paper) published in 2004. In fact that multi-mesh space–time approach, which is called ‘enhanced-discretization space–time technique-multi-mesh (EDSTT-MM)’, was proposed in an ASME paper [1] published in 2001, described again in a conference paper [2] published in 2002, and tested on a 2D fluid–structure interaction problem in a journal paper [3] published in 2004 (received in January 2003). References [1–3] were cited in the PhD thesis (Page 3, Line 1).

Considering that References [1–3] precede the PhD thesis, and considering that at least References [2, 3] are easier to access than the PhD thesis, we refer the readers interested in the EDSTT to References [1–3]. Reference [3] includes several 1D and 2D advection of ‘Cosine hills’, computed with the EDSTT-single-mesh (EDSTT-SM). These test computations, some with rotational flow fields, demonstrate how, in the context of a stabilized space–time formulation, the local mesh refinement in the time direction can help reduce the local Courant number and lead to improved accuracy.

---

\*Correspondence to: Tayfun E. Tezduyar, Mechanical Engineering, Rice University – MS 321, 6100 Main Street, Houston, TX 77005, U.S.A.

†E-mail: tezduyar@rice.edu

## REFERENCES

1. Tezduyar T. Finite element interface-tracking and interface-capturing techniques for flows with moving boundaries and interfaces. ASME Paper IMECE2001/HTD-24206. *Proceedings of the ASME Symposium on Fluid-Physics and Heat Transfer for Macro- and Micro-Scale Gas-Liquid and Phase-Change Flows*. ASME: New York, CD-ROM, 2001.
2. Tezduyar T. Interface-tracking and interface-capturing techniques for computation of moving boundaries and interfaces. *Proceedings of the Fifth World Congress on Computational Mechanics*, Vienna, Austria. On-line publication: Available from: <http://wccm.tuwien.ac.at/>, Paper-ID: 81513, Web Site, 2002.
3. Tezduyar TE, Sathé S. Enhanced-discretization space-time technique (EDSTT). *Computer Methods in Applied Mechanics and Engineering* 2004; **193**:1385–1401.