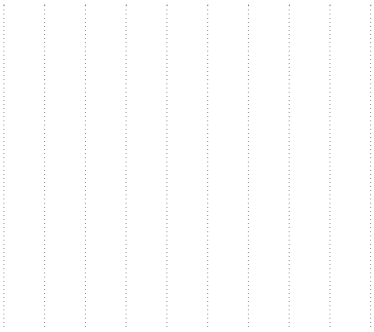
Shocktube Problem - Status Report 4
ICE Algorithm Description

Oren E. Livne

ContenCon

1 ICE Algorithm for Scalar Advection

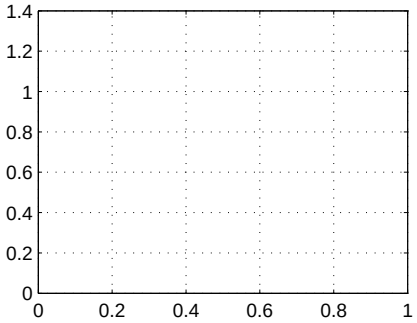
We describe and implement Bucky's ICE algorithm for scalar conservation laws, see [Kas00, pp. 27{29]. This scheme turns to be almost equivalent to Davis' scheme [Dav87], ho

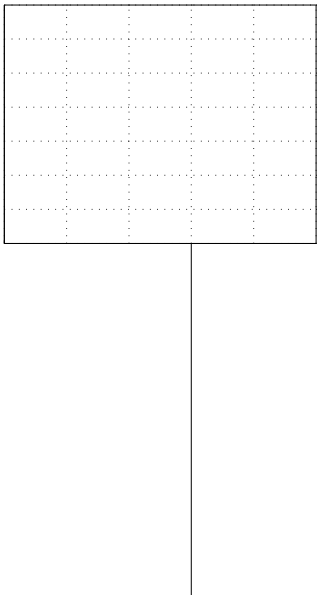


5. Compute Lagrangian quantities: these values seem to b

OREN E.

The Lagrangian operator advances Q using the equation $Q_t = -S(Q)$ (with-


1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
0.2
0.4
0.6
0.8
1



3 Conservative ICE Algorithm for Euler

3.1 The Equations

The difference between the algorithm in this section and the ICE algorithm in §2 is the formulation of the energy equation. We use the conservative form of the Euler system, replacing i (specific internal energy) by e (specific energy), where

4 Concluding Remarks and Questions for Bucky

- **The scalar ICE algorithm works, except near sonic points, where we**

[Liv05] O. Livne. Ice algorithm for the shocktube problem status report 3: Davis advection scheme. Technical report, University of Utah, Salt Lake City, UT, February 23, 2005.

[ZB93] G. C. Zha and E. Bilgen. Numerical solutions of Euler equations by using a new °ux vector splitting scheme. Int. J. Num. Methods in Fluids, 17:115{144, 1993.