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A triangle based nonoscillatory shock capturing algorithm was developed and applied successfully to immiscible oil recovery problems. Chevron researchers are now using this successfully for real problems.

Grid orientation effects in immiscible flows were reduced dramatically via 3rd order accurate ENO schemes. Again, Chevron researchers are using this method in their codes.

High-order ENO schemes were applied to three dimensional compressible gas flow problems. Shock-turbulence interactions were successfully computed. Standard methods, e.g. spectral techniques, fail in the presence of discontinuities.

A new simple method for computing detonation waves accurately was developed. This enables one to compute complicated chemical reactions in multiple species. The method used successfully for ZND detonation waves.

Shocks were discovered numerically for the hydrodynamic submicron semi-conductor device model.

Nonlinear ENO filters were developed and used successfully, simplifying high order accurate shock calculations.

Multiresolution analysis was proposed as a device for grid generation in high Reynolds number flows. Preliminary results look very promising.

Travelling waves were found for a singular diffusion equation arising in self-organized criticality. These waves were proven to be stable, validating the physical and numerical evidence.

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