Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

**Supersonic flows of a BZT fluid over thin airfoils**[1] FATEMEH BAH-MANI, MARK CRAMER, Virginia Tech — We solve a quartic Burgers equation to describe the steady, two-dimensional, inviscid supersonic flow field of a Bethe-Zel'dovich-Thompson (BZT) fluid generated by thin airfoils or turbine blades. A parabolic arc airfoil has been considered. A motivation for this problem is to illustrate the complex flow patterns possible for simple airfoil shapes. The freestream state will be chosen so that the fundamental derivative of gas dynamics is negative for part or even all of the flow. The Burgers equation is solved using the WENO technique. This is the second motivation for this work to demonstrate that the WENO technique is well-suited to the study of BZT fluids. Phenomena of interest include the partial and complete disintegration of compression shocks, the formation of expansion shocks, and the collision of expansion and compression shocks.

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Date submitted: 02 Aug 2013                    Electronic form version 1.4