Calculations of the MERIT Mercury Jet at 33 mrad Using the UCLA HIMAG Code

Neil Morley and Manmeet Narula
Fusion Science and Technology Group, UCLA
http://www.fusion.ucla.edu , morley@fusion.ucla.edu

Dec 9, 2005

UCLA

Jet case 05

- Jet location at 50 cm upstream of magnet center, and 1.65 cm below the magnetic axis of the solenoid.
- Jet tilt 33mrad (1.89 degrees) w.r.t the horizontal. The magnetic axis is horizontal. All plots drawn in the reference frame of the inlet nozzle.
- Jet inlet velocity: 20 m/s.
- Inlet condition on electric potential: $\Phi = 0$.
- Outlet current boundary condition: $J_n = 0$.
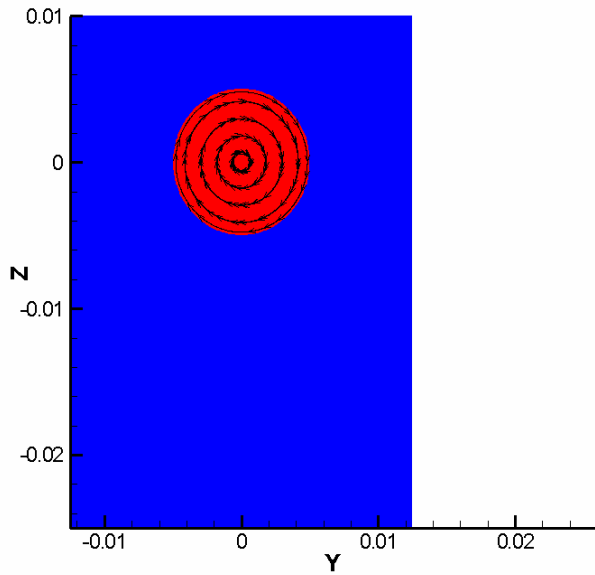- MHD force turned off in the last 2cm flow length.
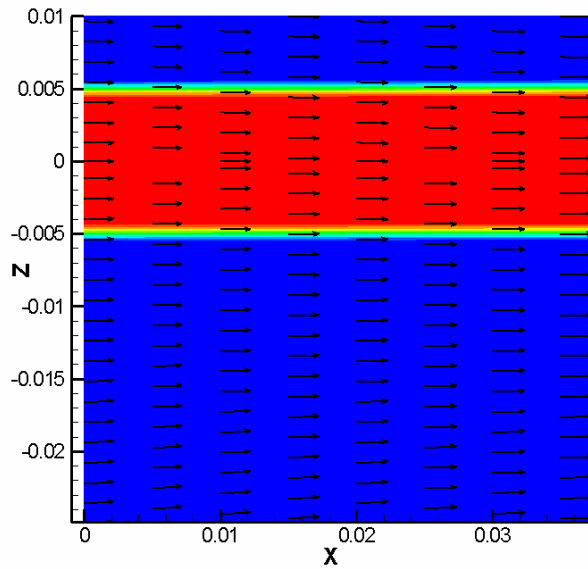
The jet cross section at the center (Y=0) and the planer magnetic field vectors. The X axis is the axis of the inlet nozzle that makes an angle of 1.89 degrees to the horizontal.
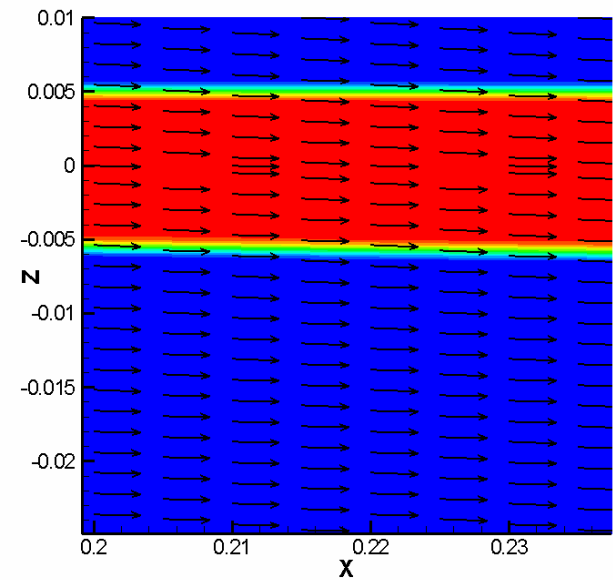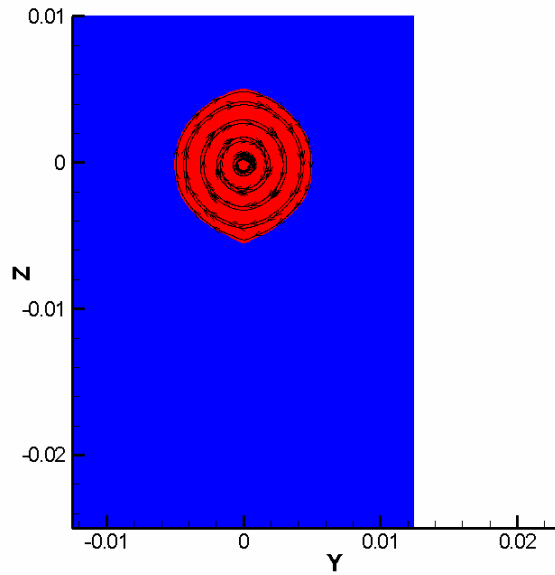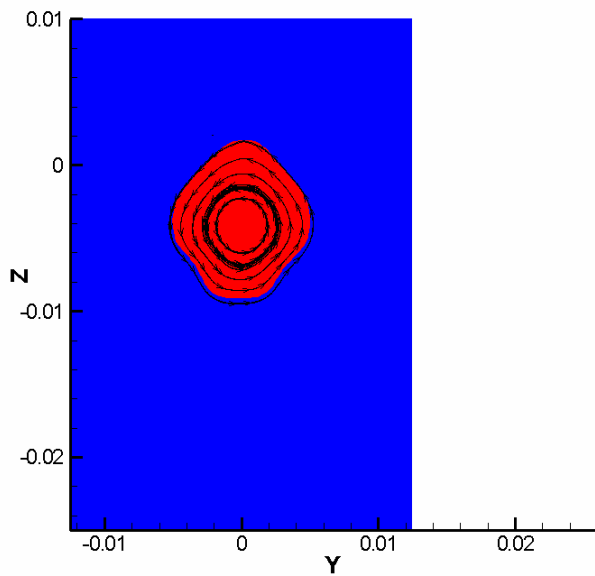
The four figures show the same plot at different locations along the initial jet axis.
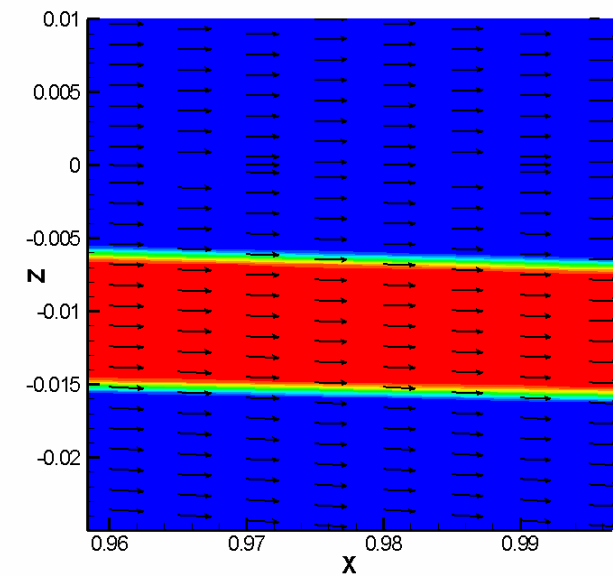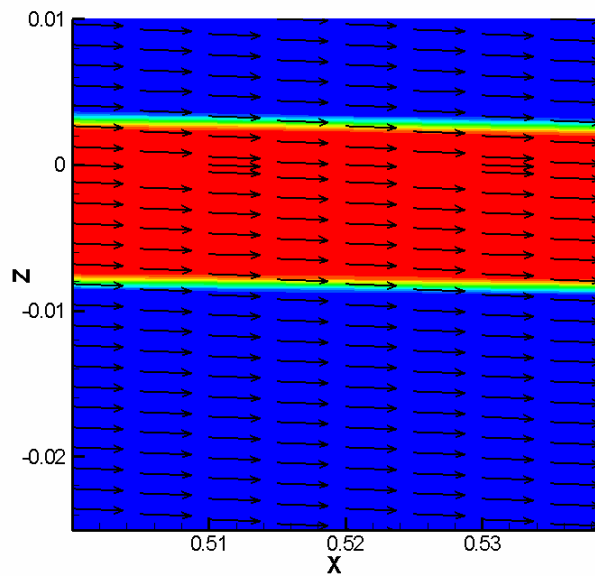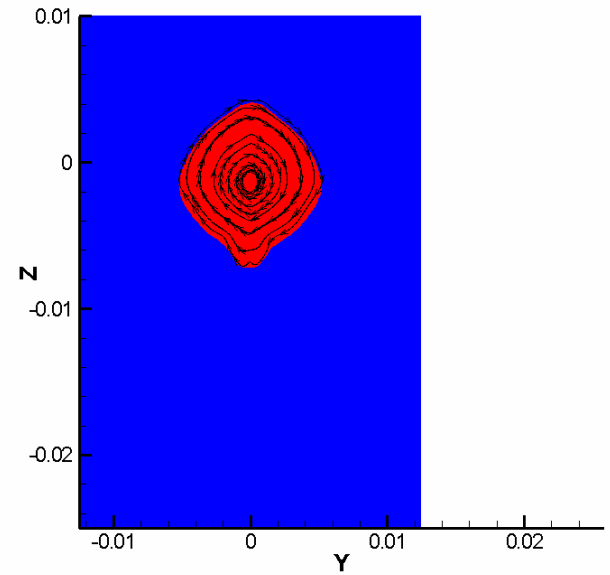
Jet section at 2.5 cm from the inlet,
Current streamlines clockwise

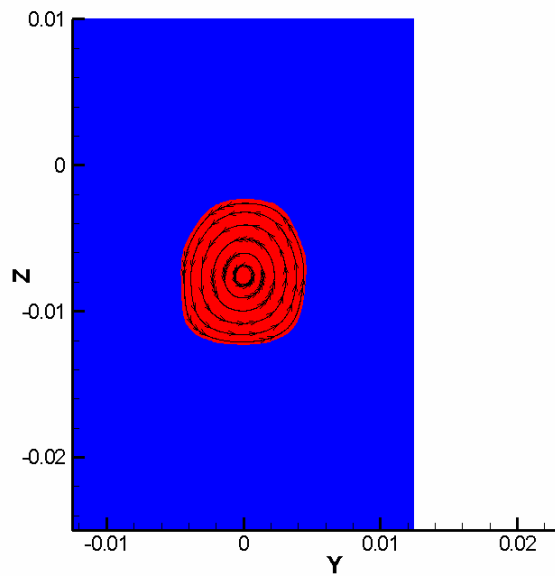Jet section at 20 cm from the inlet,
Current streamlines clockwise

Jet section at 40 cm from the inlet,
Current streamlines clockwise

Jet section at 60 cm from the inlet,
Current streamlines anti clockwise

Jet section at 80 cm from the inlet,
Current streamlines anti clockwise

Jet section at 98 cm from the inlet,
Current streamlines anti clockwise