3D Hg Jet Simulation With A Weld

Yan Zhan
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Boundary Conditions

The dimension shown in the draft is normalized by $D_{\text{jet exit}}$, which is 0.01 meter. No gravity in the model.

Input at velocity inlet from pipe-flow study with a 30° weld out of bend plan, and with a 90°/90° bend. Mesh: 15M.

Axial velocity imposed at the jet inlet (a) x line plot (b) y line plot
Results of $\alpha_{Hg}$ at $t = 0$ s (initial)

$\alpha_{Hg} = \text{volume fraction of Hg.}$

1 velocity flow thru time $= 25$ ms.
Results of $\alpha_{\text{Hg}}$ at $t = 0.2$ $\mu$s (one time step)

$\alpha_{\text{Hg}}$ = volume fraction of Hg.

1 velocity flow thru time = 25 ms.
Results of $u_z$ at $t = 0.2 \, \mu s$ (one time step)

$z = 0 \, \text{cm}$

$z = 1 \, \text{cm}$

$z = 5 \, \text{cm}$

$z = 10 \, \text{cm}$

$z = 15 \, \text{cm}$

$z = 20 \, \text{cm}$

$z = 30 \, \text{cm}$

$z = 45 \, \text{cm}$

$u_z = z$-component of velocity.

1 velocity flow thru time = 25 ms.
Results of $\alpha_{\text{Hg}}$ at $t = 12$ ms

$\alpha_{\text{Hg}} = \text{volume fraction of Hg.}$

1 velocity flow thru time = 25 ms.
Results of $u_z$ at $t = 12$ ms

$z = 0$ cm

$z = 1$ cm

$z = 5$ cm

$z = 10$ cm

$z = 15$ cm

$z = 20$ cm

$z = 30$ cm

$z = 45$ cm

$u_z = z$-component of velocity.

1 velocity flow thru time = 25 ms.