Discussion: 3 D Hg Jet Simulation

Yan Zhan

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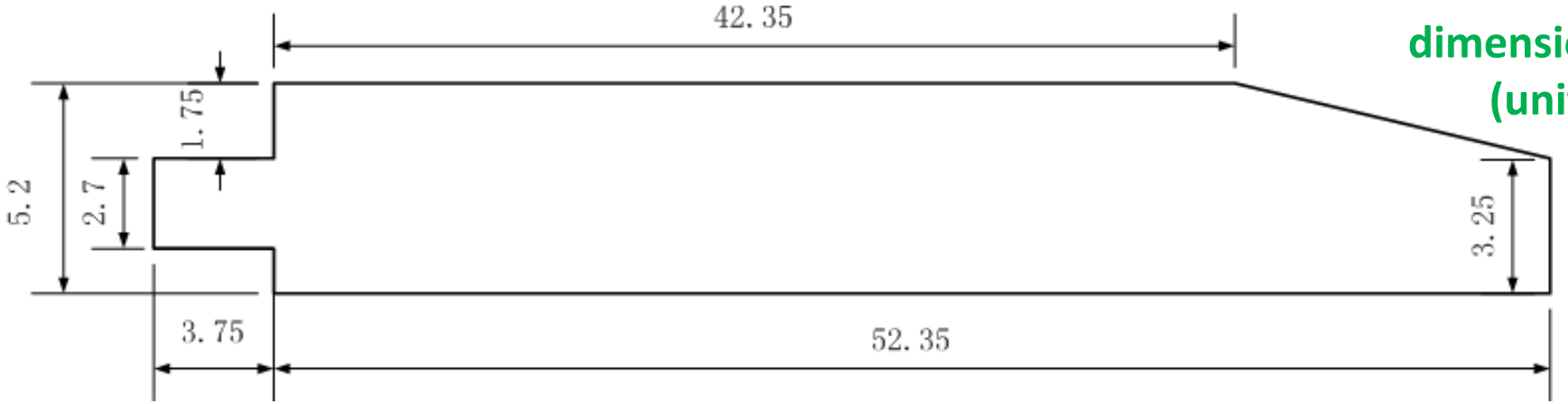
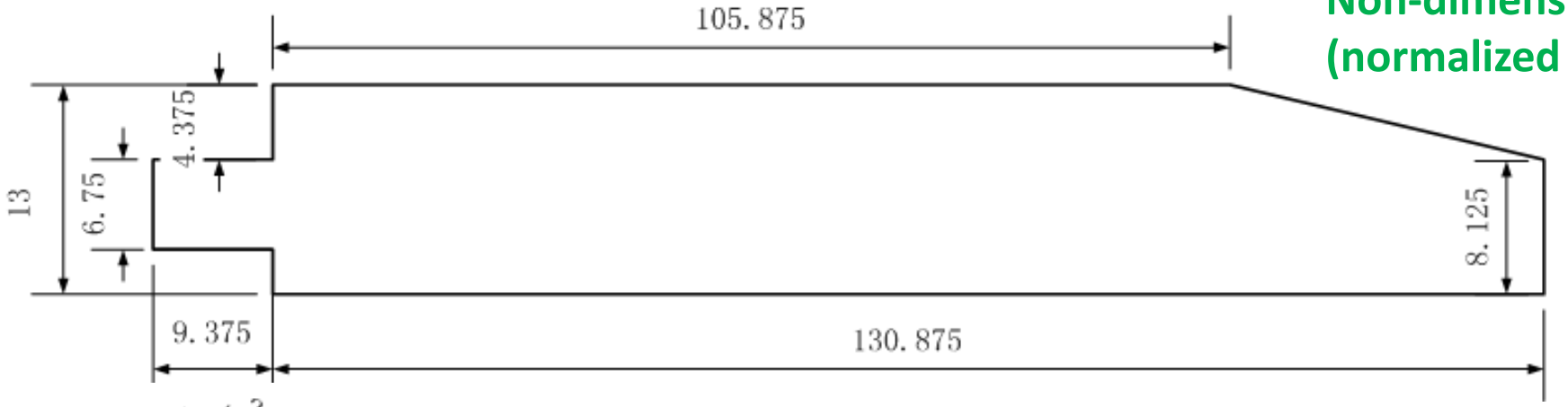
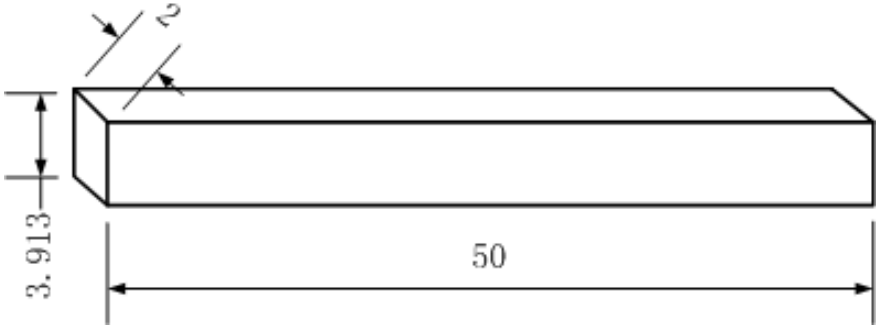
Simplification Of The 3D Hg Jet



dimensional model
(unit: inch)

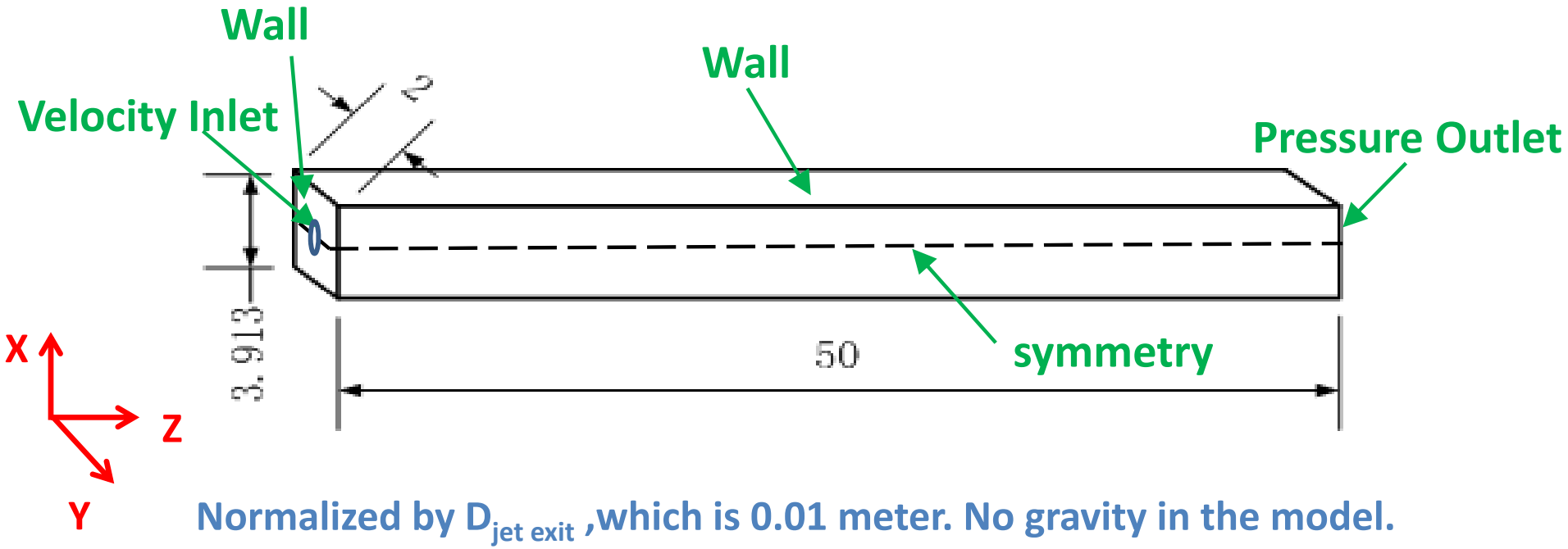


Non-dimensional model
(normalized by $D_{jet\ exit}$)

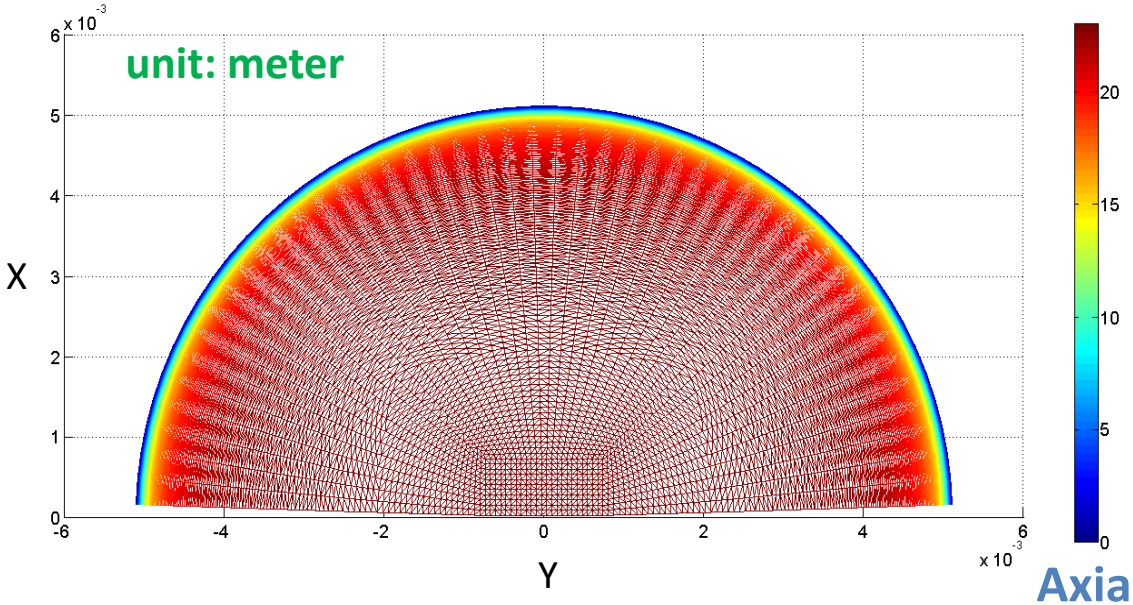


Simplified model
(normalized by $D_{jet\ exit}$)

Boundary Conditions



Normalized by $D_{jet\ exit}$,which is 0.01 meter. No gravity in the model.



pipe simulation

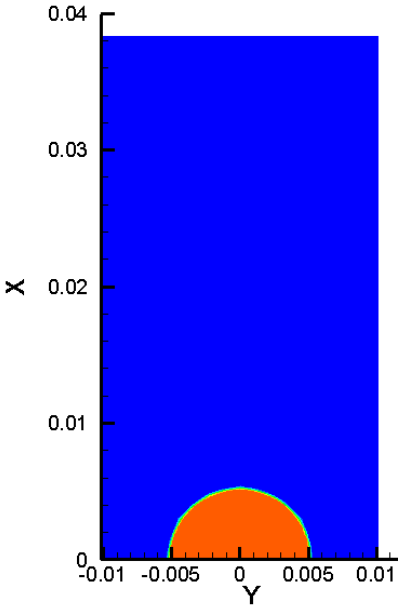
u = U + sqrt(2k/3),

where k = ½((u')^2+(v')^2+(w')^2)

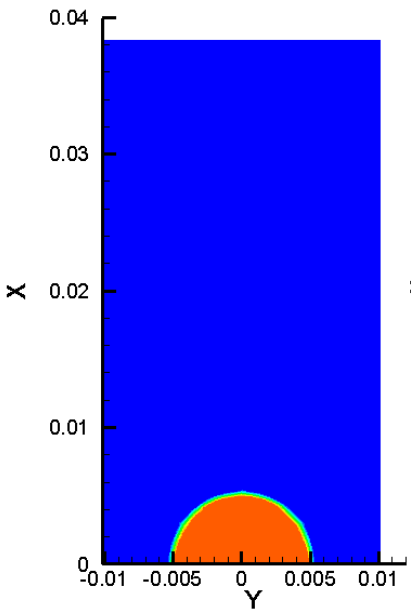
Axial Velocity Contour At The Jet Inlet

Results of α_{Hg} at t = 0 ms

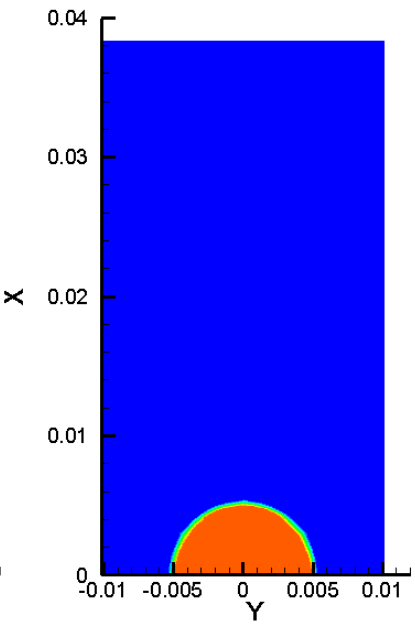
z= 0 cm



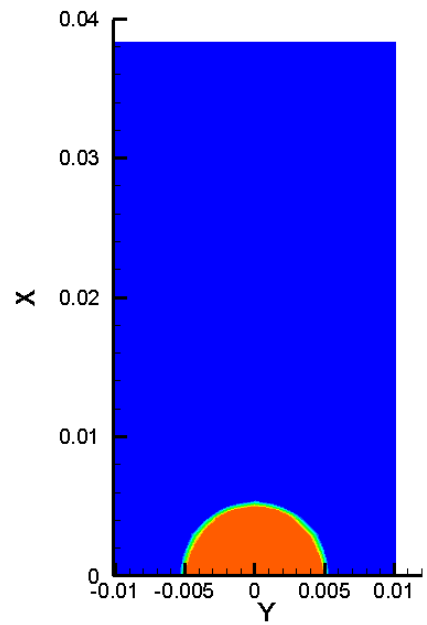
z = 1 cm



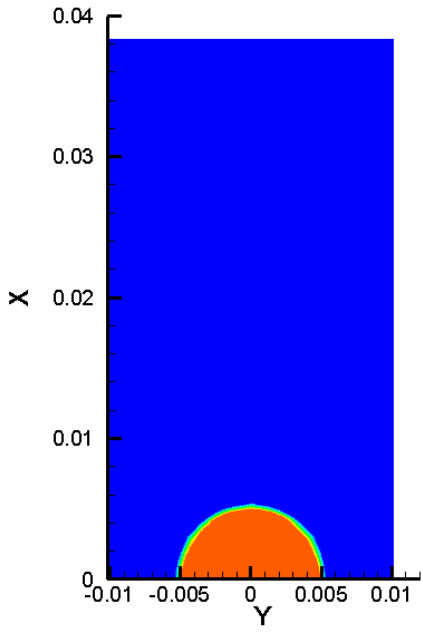
z = 5 cm



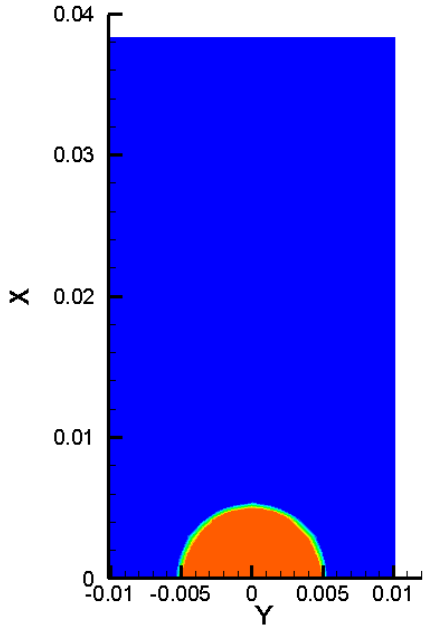
z = 10 cm



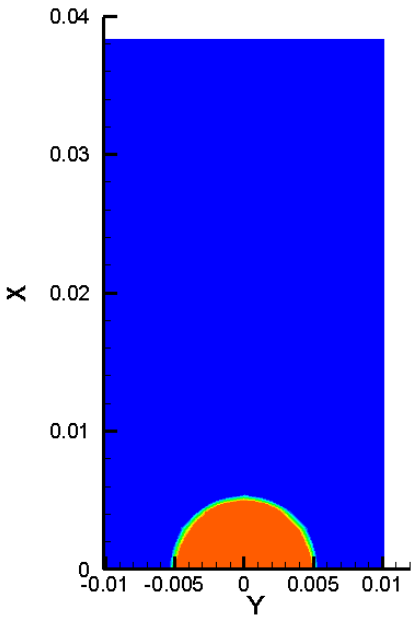
z = 15 cm



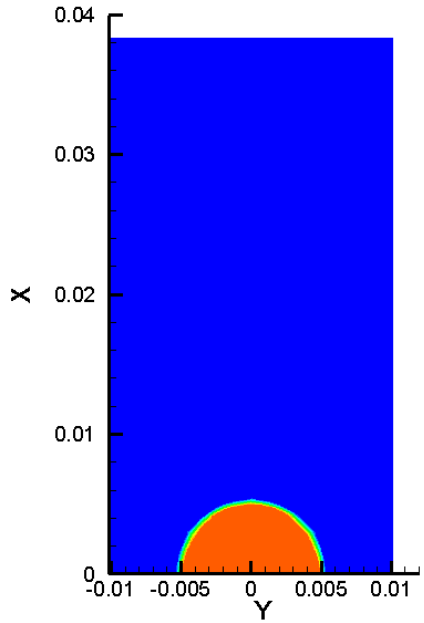
z = 20 cm

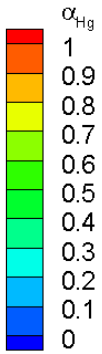


z = 30 cm



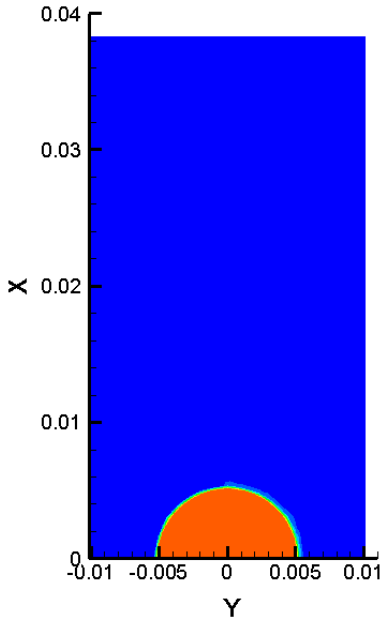
z = 45 cm



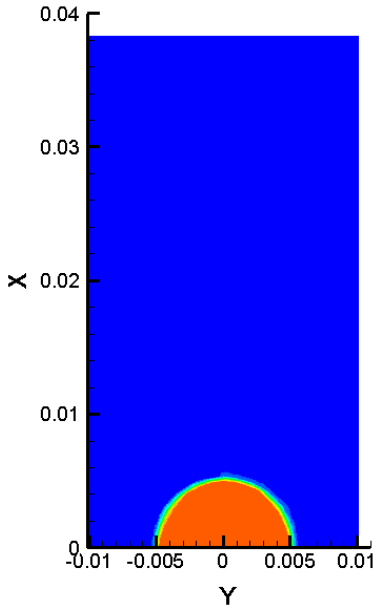


Results of α_{Hg} at t = 0.2 μs (one time step)

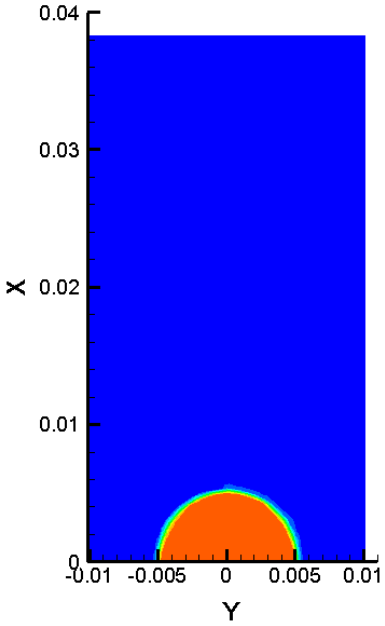
z= 0 cm



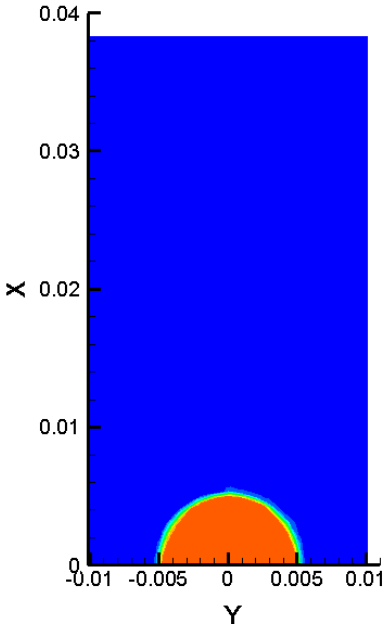
z = 1 cm



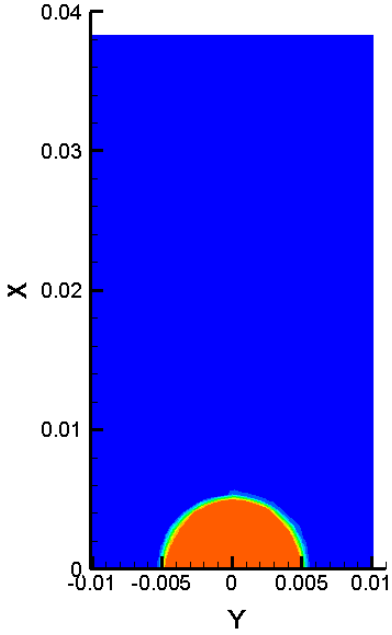
z = 5 cm



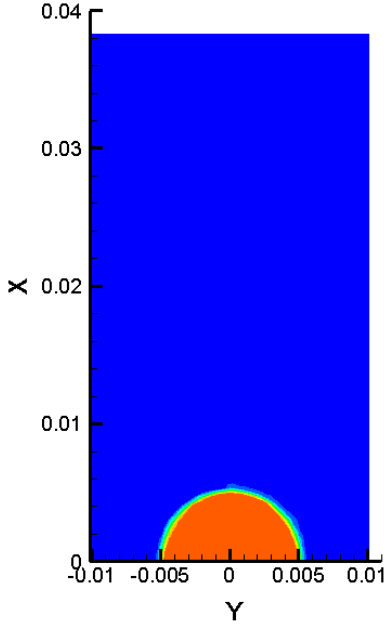
z = 10 cm



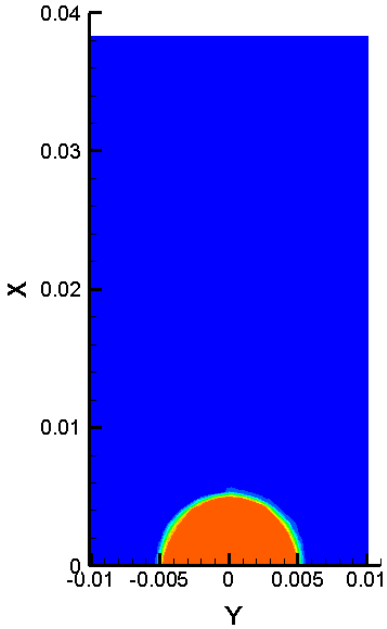
z = 15 cm



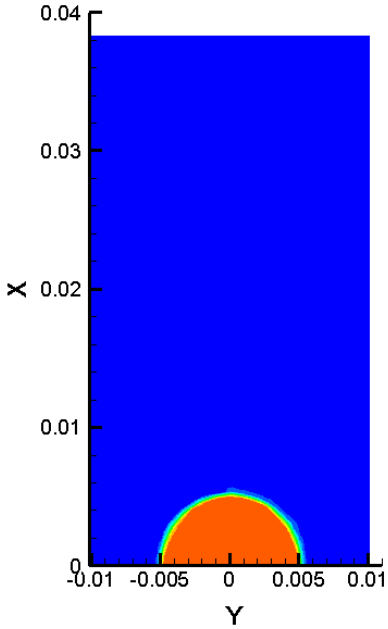
z = 20 cm

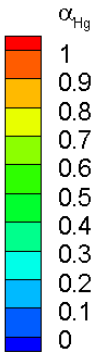


z = 30 cm



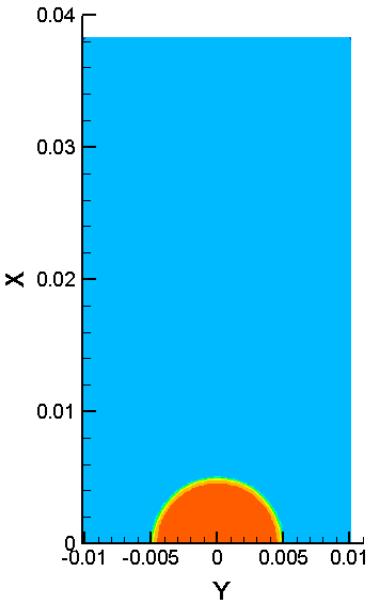
z = 45 cm



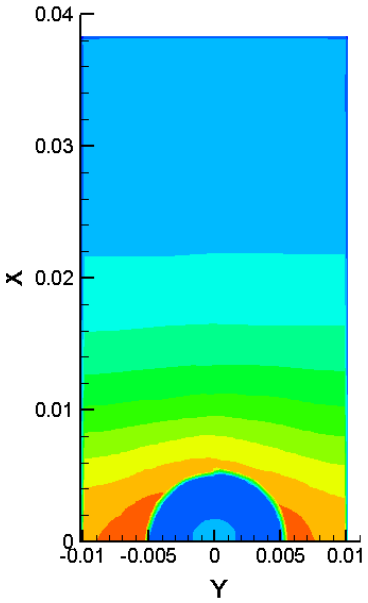


Results of u_z at t = 0.2 μs (one time step)

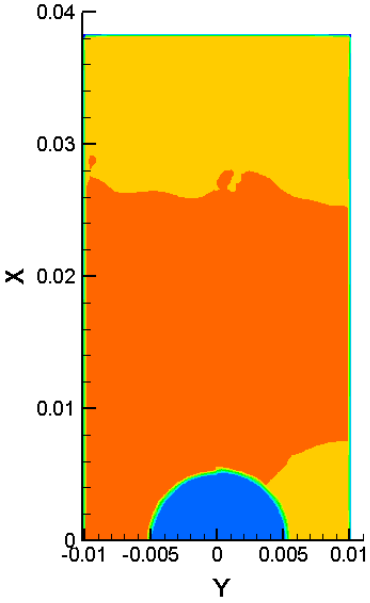
z= 0 cm



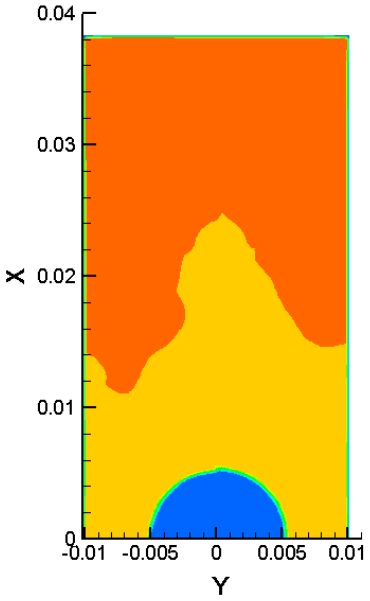
z = 1 cm



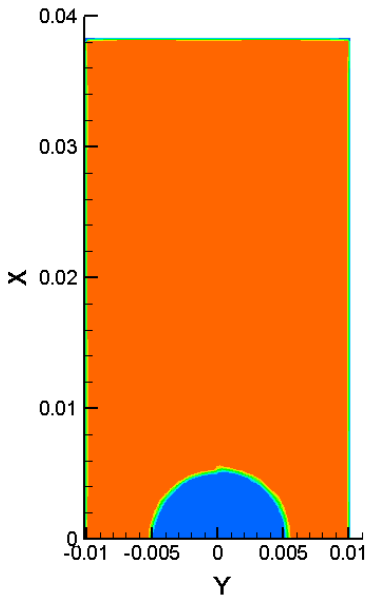
z = 5 cm



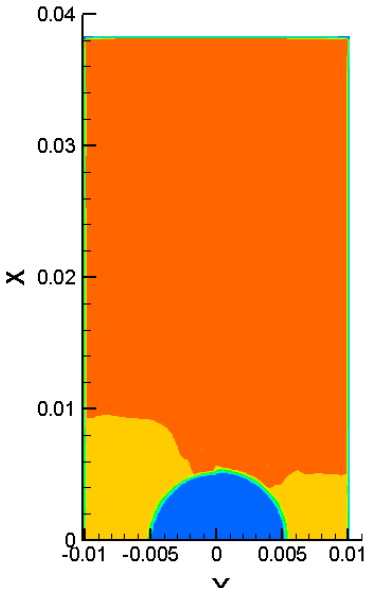
z = 10 cm



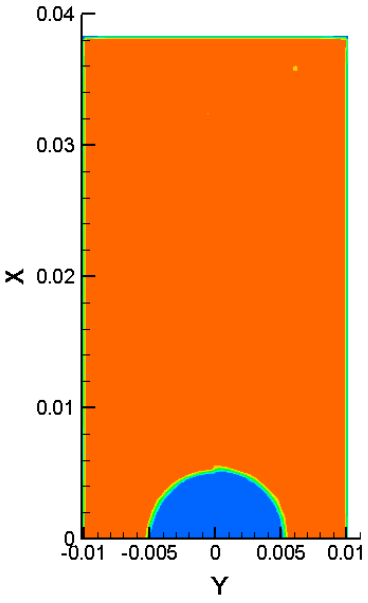
z = 15 cm



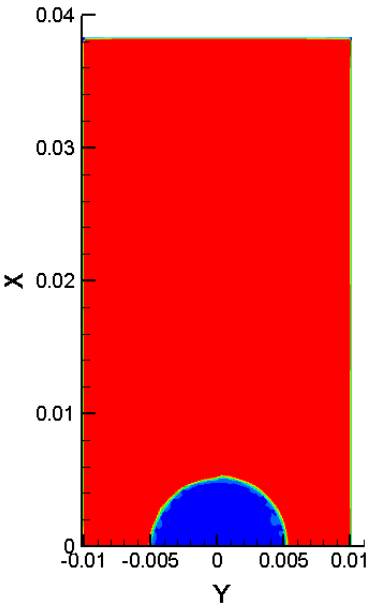
z = 20 cm



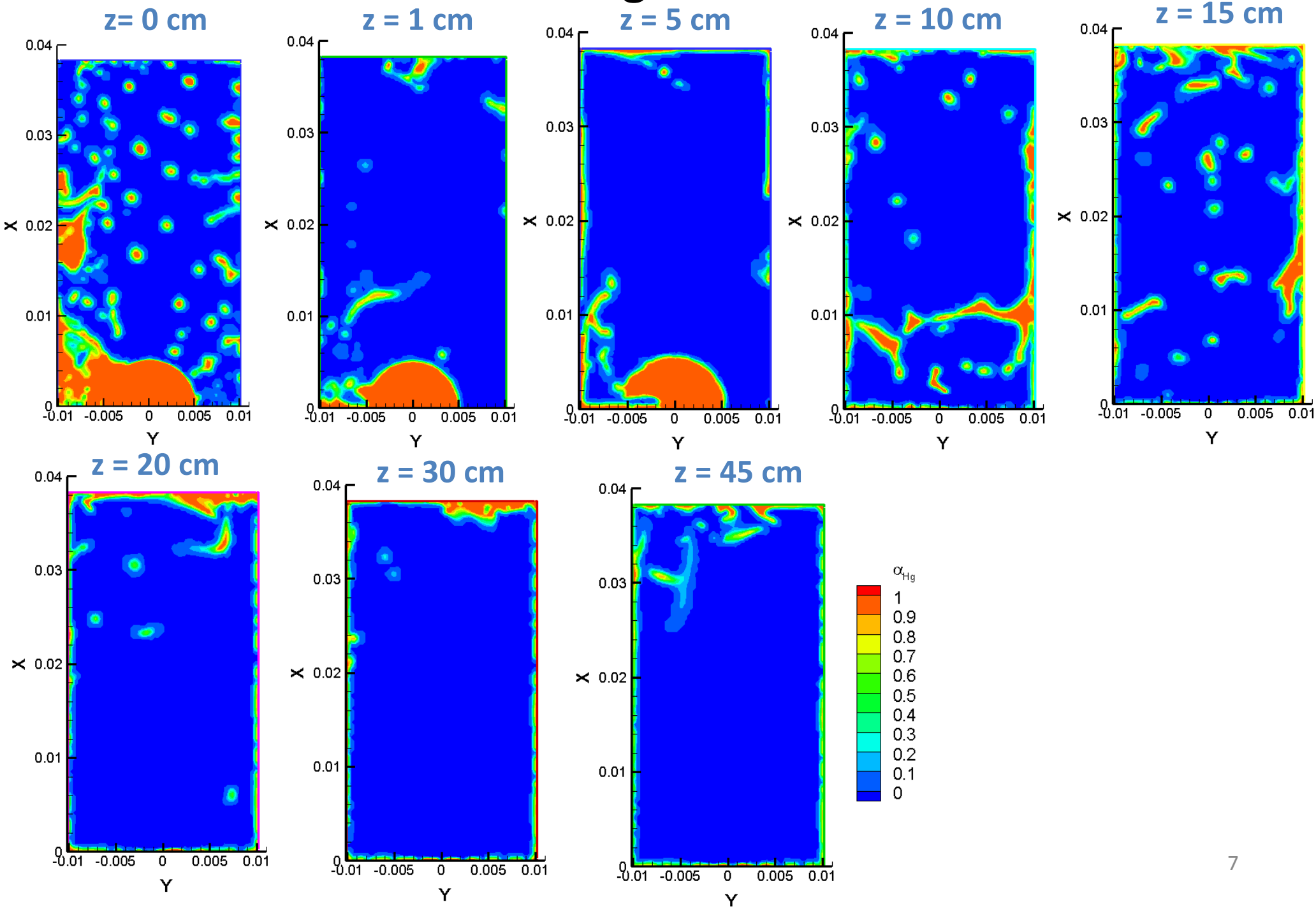
z = 30 cm



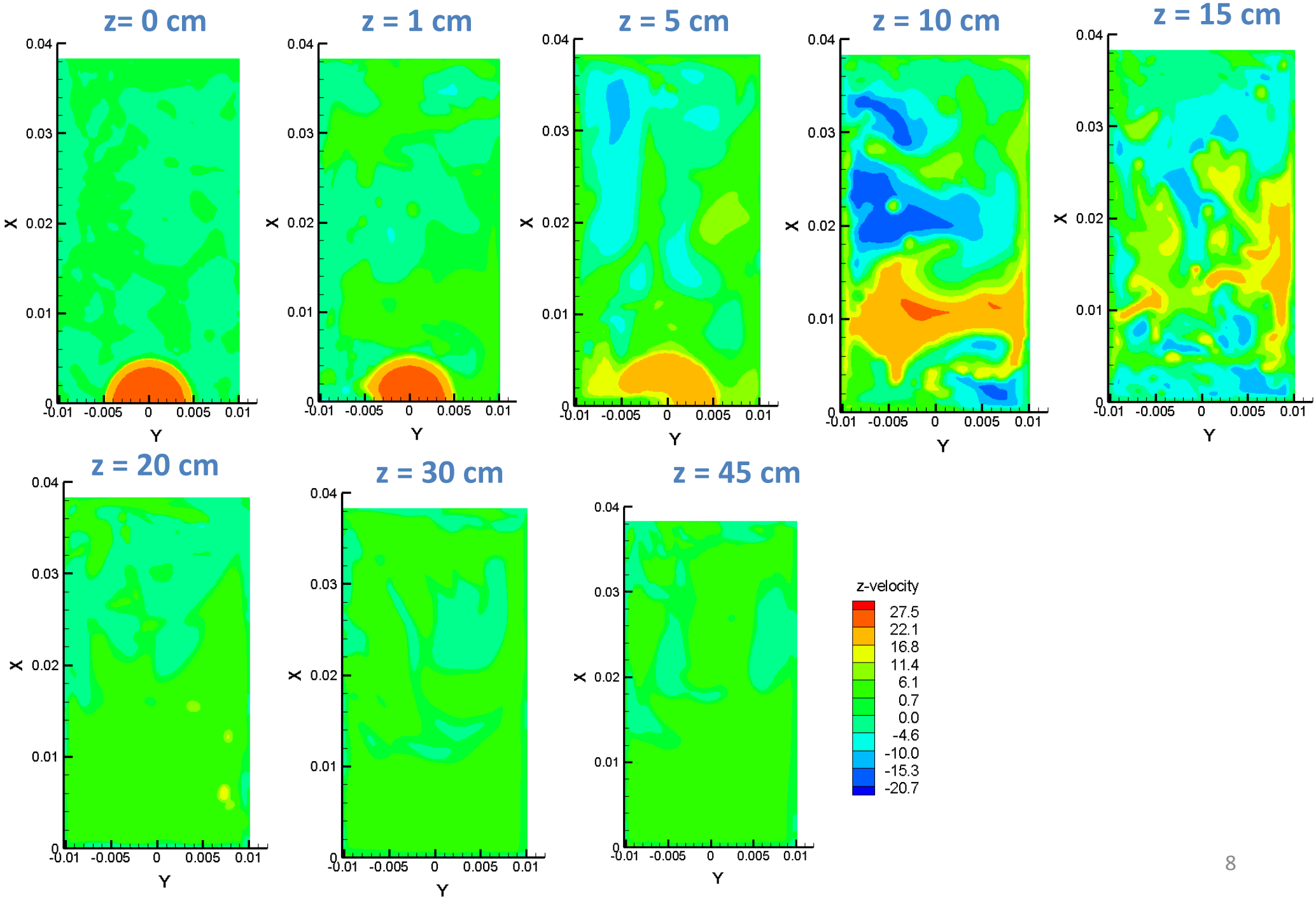
z = 45 cm



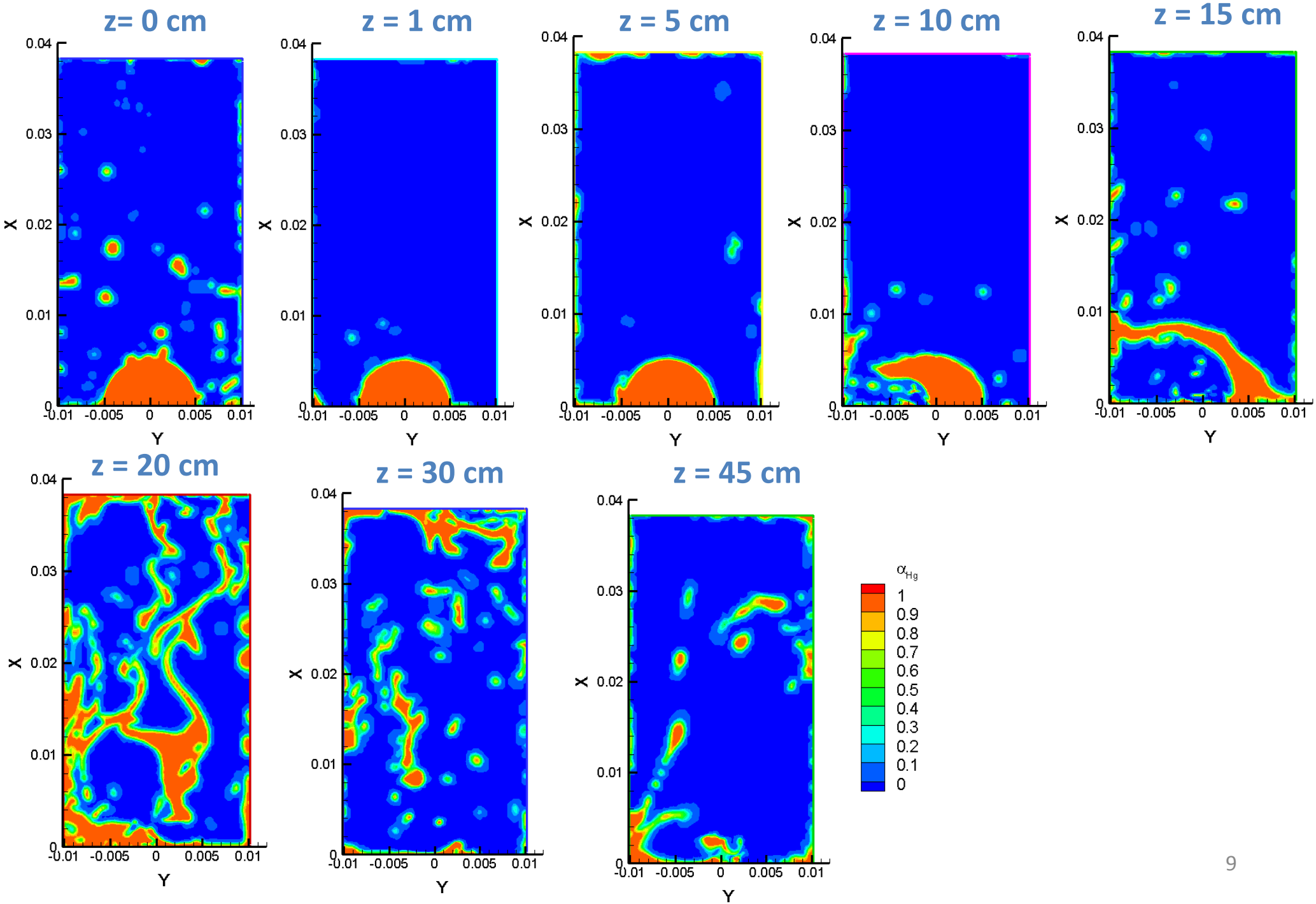
Results of α_{Hg} at t = 9.6 ms



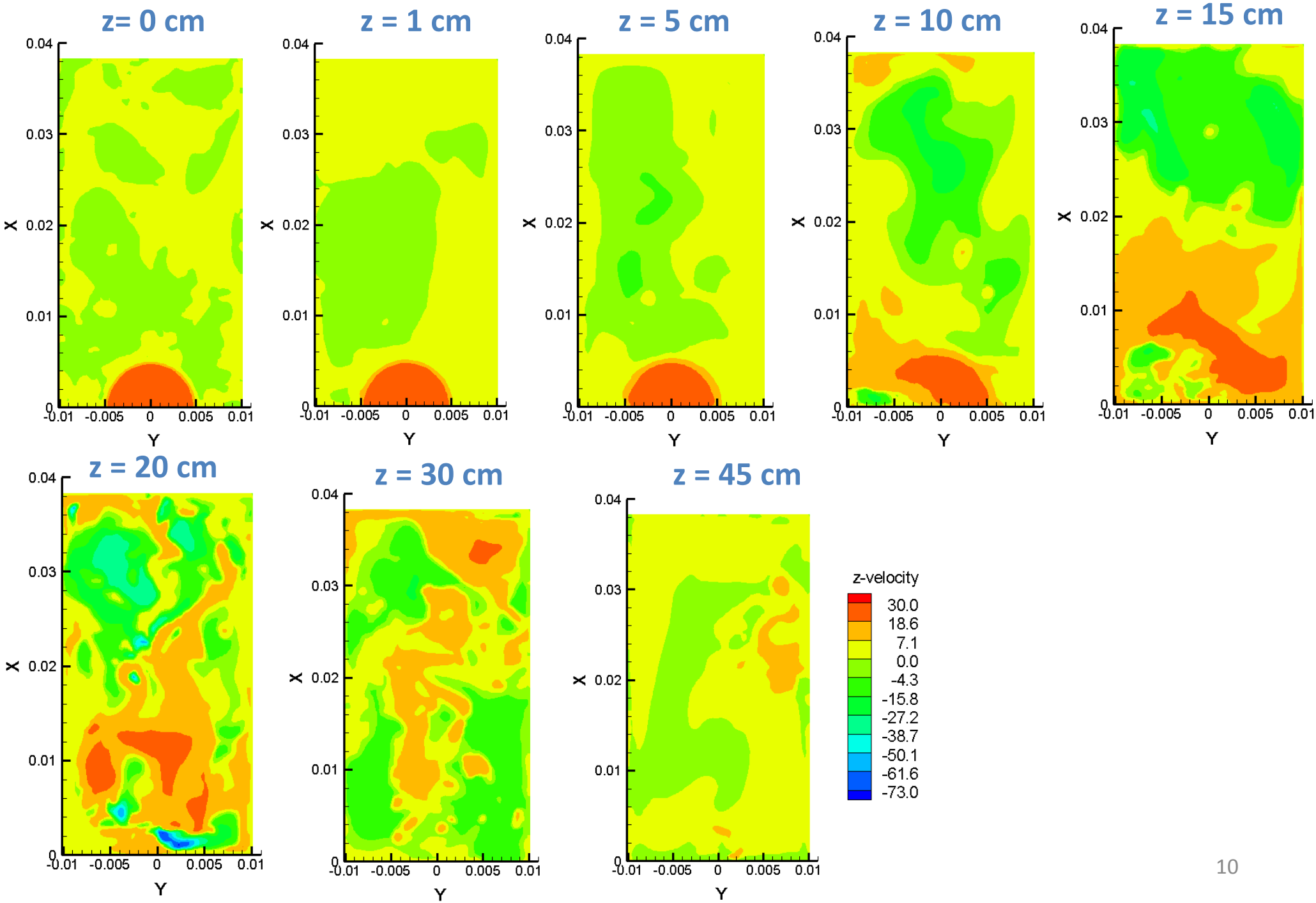
Results of u_z at t = 9.6 ms



Results of α_{Hg} at t = 25 ms (one time through)



Results of u_z at t = 25 ms (one time through)



Results of x-vorticity at t = 25 ms (one time through)