Part III

Challenge #4

Mesh details:



Geometry details:*Special note: geometry base is 1.5cm below x-axis*



(a) Viscous-laminar model: (i), (ii), (iii), (iv)

(i) Description of the boundary conditions: used Pressure Outlet for both boundaries-



(ii) Line plot of the water levels as a function of time. $t_1 = 0.552s \& t_2 = 1.52s$



(iii) Plots of velocity vector field

Scaled Residuals	🖾 🗸 🔛 Velocity Vectors Colored By Velocity Magnitude (mixture) (my	/s) 🗵 🔪
6.27e-01		ANSYS
5.95e-01		R17.1 Academi
5.64e-01		
5.33e-01		
5.02e-01	- 역동학관은 분명 - 교육관	가 있었다.
4.71e-01		
4.39e-01		A MARINE AND A MARINE A
4.08e-01	$= \prod_{i=1}^{n} \frac{(a_{i})_{i}^{(a_{i})}}{(a_{i})_{i}} \frac{(a_{i})_{i}}{(a_{i})_{i}} (a$	$\left(\frac{1}{2}\right) \left(\frac{1}{2}\right) \left(\frac{1}{2}\right) \left(\frac{1}{2}\right) \left(\frac{1}{2}\right)$
3.77e-01		B. S. Prode
3.46e-01	$u_{n}^{+} \left\{ h_{1}^{+} , u_{n}^{+} u_{n}^{+} , h_{1}^{+} \right\} \left\{ h_{1}^{+} , e_{1}^{+} , h_{2}^{+} \right\} = \left\{ h_{1}^{+} , h_{2}^{+} , h_{2}^{$	A stranger in the
3.14e-01	$= \frac{1}{10^{10}} \frac{10^{10}}{10^{10}} 10^{10$	V R WERE - THE
2.83e-01		
2.52e-01		
2.21e-01	And all the second and the	
1.90e-01		
1.58e-01		5 <u>7</u>
1.27e-01		
9.59e-02		32
6.46e-02		
3.34e-02		
2.21e-03	0 0.2 (m)	

Scaled Residuals	Velocity Vectors Colored By V	elocity Magnitude (mixture) (m/s) 🛛 🔪	
5.50e-01			ANSYS
5.23e-01			Academi
4.95e-01			
4.68e-01	Enderst March 1996	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
4.40e-01	and the second second second second		
4.13e-01		$= \left[\left[\left[\left(\frac{3}{2} \right)^2 + \left[\left(\frac{3}{2} \right)^2 + \left(\frac{3}{2} \right)^$	
3.85e-01	A the second s	Service Charles	
3.58e-01	" a start of the start of the		
3.30e-01	al second of the second second	Seal Provide State	
3.03e-01	[1] The second secon		
2.75e-01			
2.48e-01			
2.20e-01			
1.93e-01			
1.65e-01		181	
1.38e-01		W Unk	
1.10e-01			
8.30e-02			
5.55e-02			
2.80e-02			
5.49e-04	0	0.2 (m)	



(iv) Contour plot of the volume fraction of water (phase 2) at half cycle of oscillation form initial time:

(b) Other boundary conditions:

Set 1) Right tank boundary condition: Outlet-vent & Left tank boundary condition: Outlet-vent





Set 2) Right tank boundary condition: Inlet-vent & Left tank boundary condition: Inlet-vent





The investigation of three boundary conditions at the top openings that affect the solution/simulation are displayed above. As you can see with both of the boundary conditions set to Outlet-vent or Inlet-vent the simulations runs the same as part (a) where the boundary conditions are set to Pressure Outlet. However, once you set the boundary conditions to wall the simulation still runs but different results are obtained as seen above, and for this case the water level does not move with time. Lastly, further investigations was done but not shown due what was requested and the further investigation showed that any combination of Pressure Outlet, Outlet-vent, and Inlet-vent would yield the same results as in part (a).