Femlab Tutorial: A first Example: Note

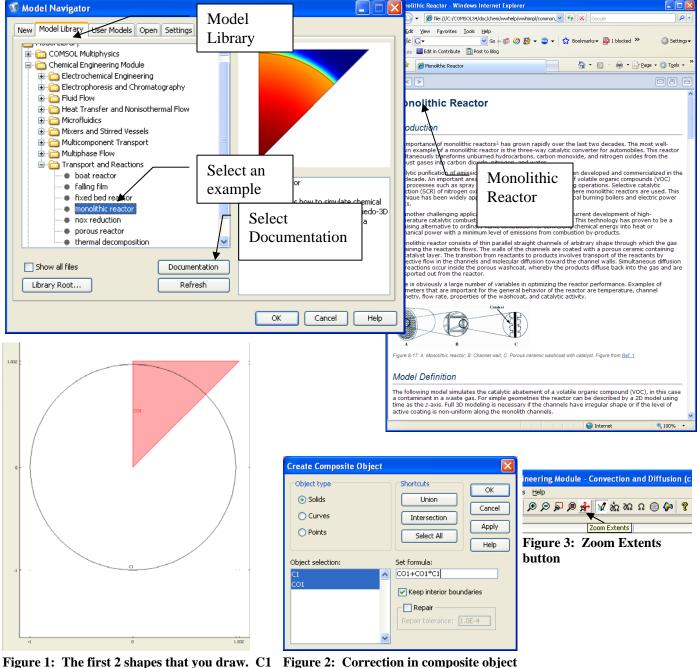
Open Comsol Multiphysics 3.2, Select the Model Library tab, Then select any model within the chemical engineering Module library as shown below. Then press the documentation button.

Then select Go to the Chemical Engineering Module

Overview

A First Example

as shown below



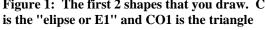


Figure 2: Correction in composite object formula from the Multiphysics 3.4 tutorial

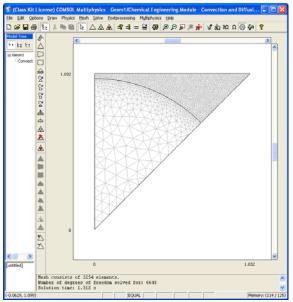


Figure 4: Meshing result

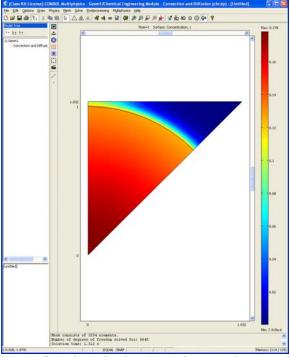


Figure 5: Default Surface Plot after solution solved

General Surface Co	ntour Boundary	Arrow
streamline Particle Tracing	Max/Min Deform	Animate
Movie settings	Solutions to use	
File type: AVI 💌	Select via: Stored outp	ut times 🔽
Width (in pixels): 640	0	
Height (in pixels): 480	0.1	-
rames per second: 10	0.2	
Advanced	0.3	
Hardicouri	0.4	
Static / Eigenfunction animation	0.5	
Cycle type: Full harmonic 🗸	0.6 0.7	
Number of frames: 11	0.8	
vumber of frames: 11	0.9	×
Reverse direction	Times:	
Use camera settings from main window		
J ose camera securigs from main window		
	_	tart Animation

Figure 6: Plot Parameters, Animate Tab, press the Start Animation button

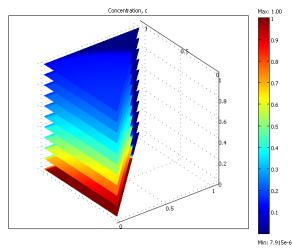


Figure 7: Result of Plotting both Domains 1 and 2 using the Domain Plot Parameters - Surface Plot (You can rotate this figure by clicking on it with your mouse and dragging it.)

Compute the average concentration at the inlet and outlet boundaries. The average concentration is given by

 $\overline{c} = \frac{\iint (c^* u_{dl}) dx dy}{\iint u_{dl} dx dy}.$ To do this first calculate the average velocity and then calculate the integral

of c^*u_{dl} . Dividing these two numbers gives you the average velocity at a surface.

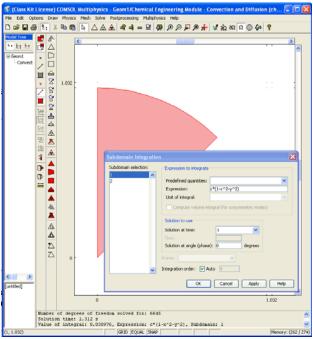


Figure 8: Subdomain Integration of the gas phase.

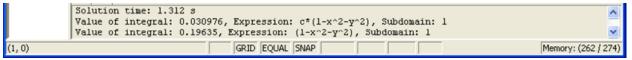


Figure 9: After the second integration

$$\overline{c} = \frac{\iint (c^* u_{dl}) dx dy}{\iint u_{dl} dx dy} = \frac{0.030976}{0.19635} = 0.158$$