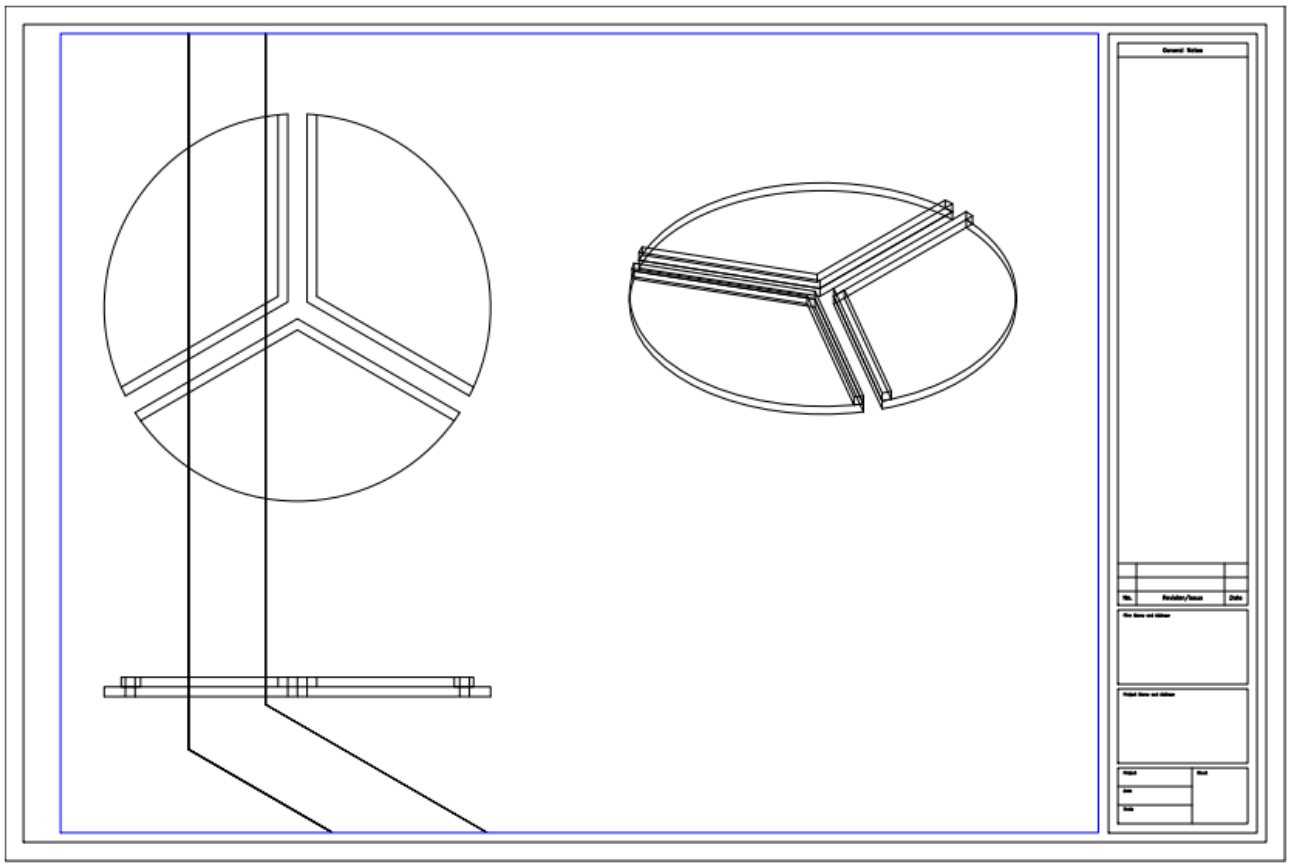
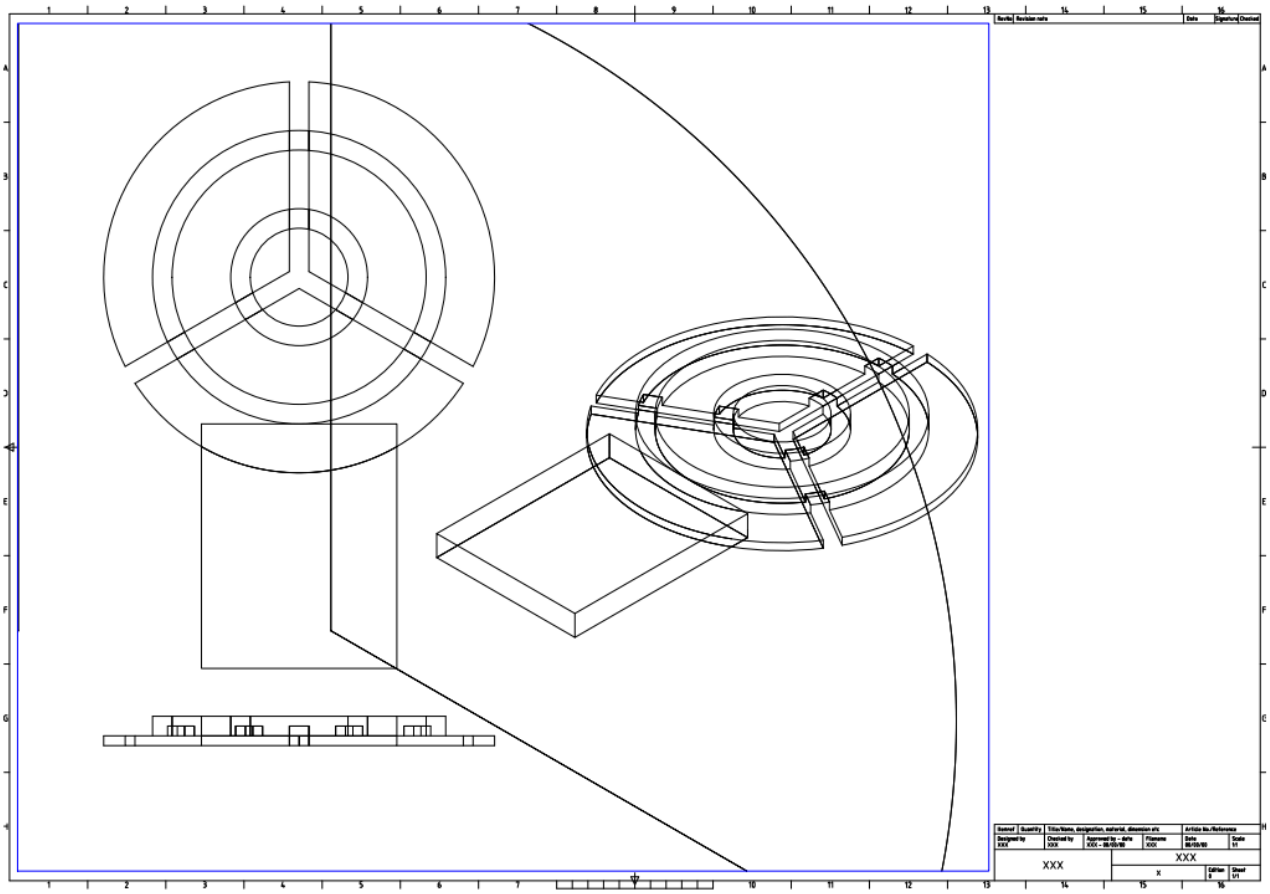
AutoCAD notes

- First try of the 3-node design



- an idea to reuse design: design a base (circular), then subtract a channel out of the base. For example, the following design can be made by simply subtract a premade base:



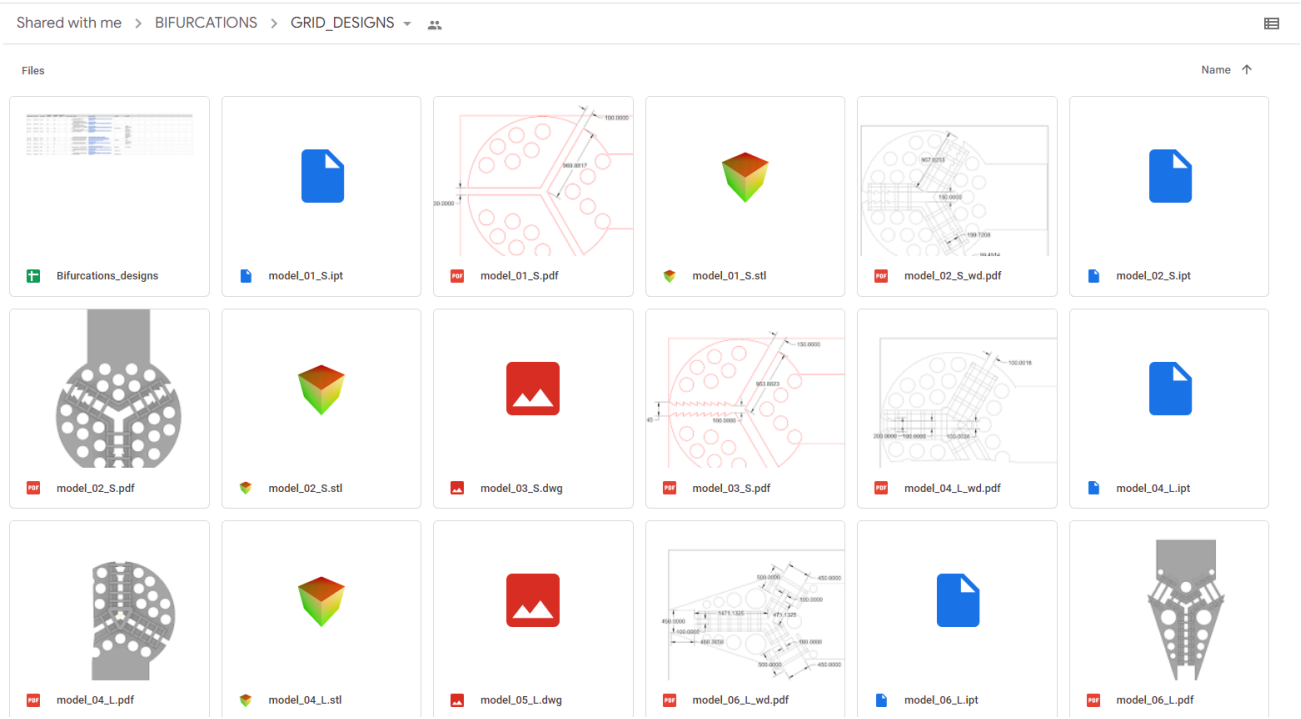
- To create a different design, just subtract the cylinder with the channel shape (200 um height).

Update on Dec 13, 2022

I started to write this note when I just came back from Corsica to start working on active nematics. After 2 months of working and training, I improved much on using AutoCAD and the intuition of what kind of grid design might work. As a result, the "ideas" above now look naive to me. Claire and I have created a repository to deposit our designs for experiment planning and future reference. I take this note as an opportunity to describe this repo.

The repo

The repository is hosted on Google Drive as a shared folder.



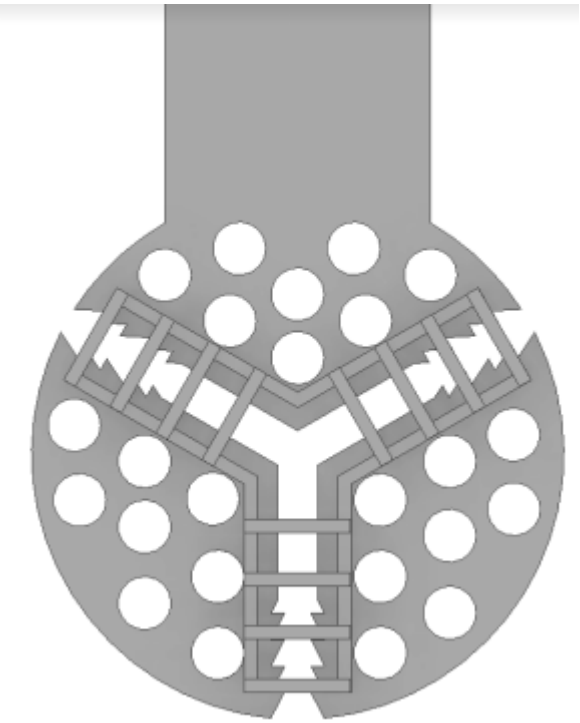
We have put all our design files (.ipt, .dwg, .stl) in this shared folder. We also generated a PDF file for each design, so we can easily preview what we already have tried.

Detailed information of the design are summarized in a spreadsheet called `Bifurcations_designs`. Here, we give each design a unique `model number` and explain the purpose of it.

	A	B	C	D	E	F	G	H	I	J
1	Model number	File name	File format	Symmetric (length)	Symmetric (angle)	Ratchet (how many)	Channel width	Purpose	Link to CAD file	old name
2	model_01	model_01_S	stl, ipt	yes	yes	0	100	Check if polarized flow state spontaneously arise	https://drive.google.com/file/d/1luzddEoEGhEHYs4nB2MKTB2HYn7Ch8XB/view?usp=share_link	
3	model_02	model_02_S	stl, ipt	yes	yes	3	150	Check if polarized flow state spontaneously arise when an input current is injected in A and both B and C have ratchet	https://drive.google.com/file/d/1QxShAr0Yl1YFeQLIG1UqMPuJ8YznKoTI/view?usp=share_link	
4	model_03	model_03_S	dwg	yes	yes	1	150	Check if polarized flow state spontaneously arise when an input current is injected in A , no ratchet in B and C	https://drive.google.com/file/d/13qTd3yGU4FAKqCZ9BAPX9Gt5iOXggmgT/view?usp=share_link	symmetric, Z04
5	model_10	model_10_S	stl, ipt	yes	yes	1	100	Check if polarized flow state spontaneously arise, when A is a weak diode (3 ratchet teeth)	https://drive.google.com/file/d/15CtBN420tH9bUEBg9S82ImrtpNxSvV-W/view?usp=share_link	
6	model_04	model_04_L	stl, ipt	no	yes	1	100	Study the effect of length imbalance with LA=1000, LB=1000, LC=500	https://drive.google.com/file/d/1QCvkZhJDt-GhYLYXPmKvSa8m6pgpSn4b/view?usp=share_link	
7	model_05	model_05_L	dwg	no	yes	1	150	Study the effect of length imbalance with LA=500, LB=1500, C=500	https://drive.google.com/file/d/1_plZZB3eaXylQxsozU-Q22iaMR2wvlpe/view?usp=share_link	length, Z01
8	model_06	model_06_L	stl, ipt	no	yes	1	150	Study the effect of length imbalance with LA=500, LB=1500, C=500	https://drive.google.com/file/d/1sZJOIoIfRPrMn8UrYhPdhZTyc3Jj8ZN-/view?usp=share_link	
9										
10	model_07	model_07_A	dwg	yes	no	1	150	Study angle role, LA=LB=LC=1000	https://drive.google.com/file/d/1TVAf-UgQZgBAKbXpMBdXxmbyr3pOlw3T/view?usp=share_link	angle, Z00
11	model_08	model_08_A	dwg	no	no	1	150	Combine angle and length effect : the branch making 90° angle with input is shorter	https://drive.google.com/file/d/1vb4MlWeaOglxUAMN9Br9yXtK6xNGYIDL/view?usp=share_link	together, Z02
12	model_09	model_09_A	dwg	no	no	1	150	Tradeoff between the angle and the length imbalance	https://drive.google.com/file/d/1UPLvHAq23a6pbaRI_kyOLfGQSYJ7FFiB/view?usp=share_link	competition, Z03
13										

Minimal design

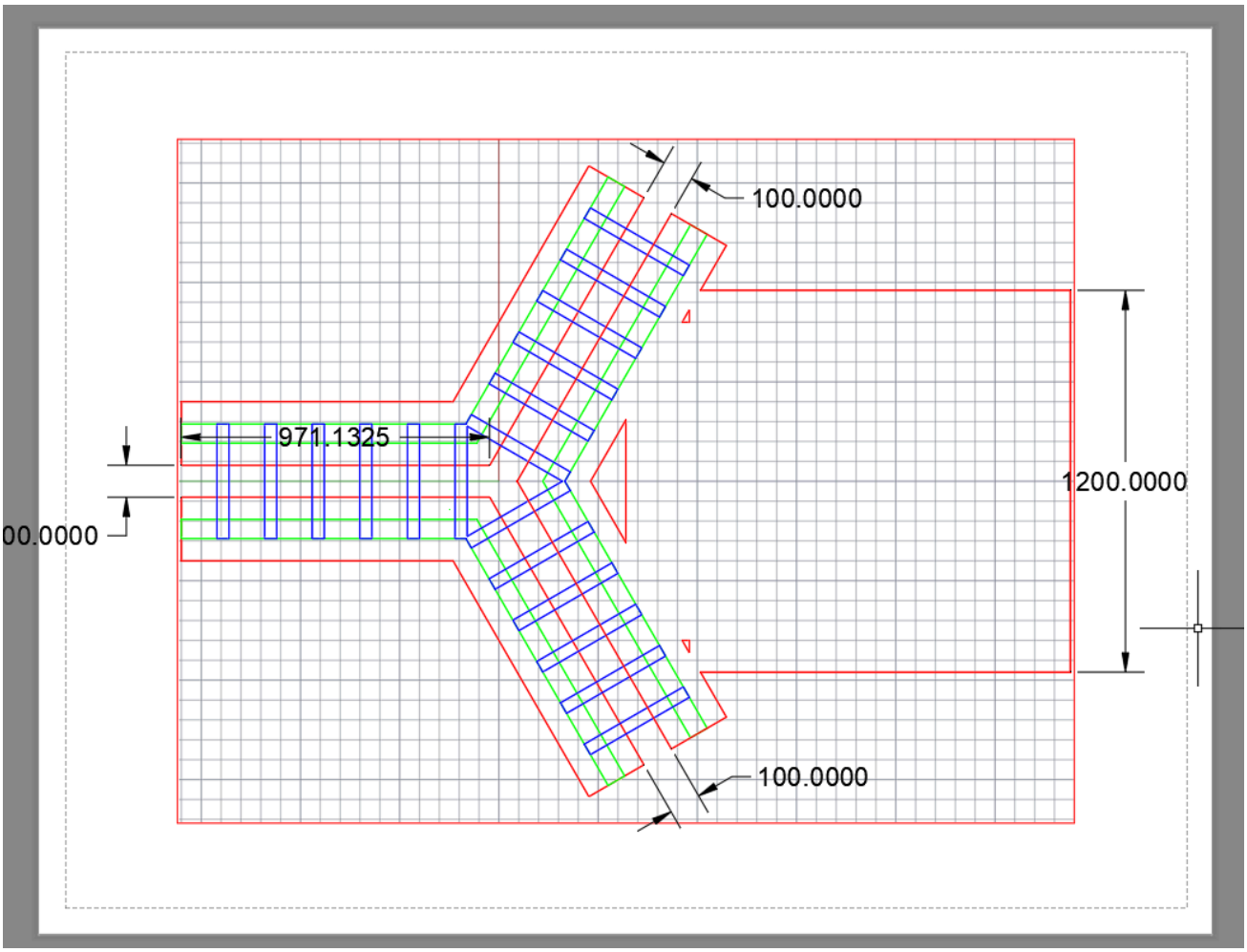
In the past, Claire always had a circular disk as the host of channels. A typical design looks like this:



Recently, I want to test if it is possible to further reduce the material amount of the grid, so that we can

- minimize the effect of grid on the interface,
- save some printing time.

Therefore, I made the following minimal design as the first try. Note that the channel part is identical to Model 01, so I still tend to call it Model 01, but with a note that it is a minimal design.



Hopefully, this design can improve the quality of channel flow.