

Practice Course in Plasma



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Thursday 9:10-12:00

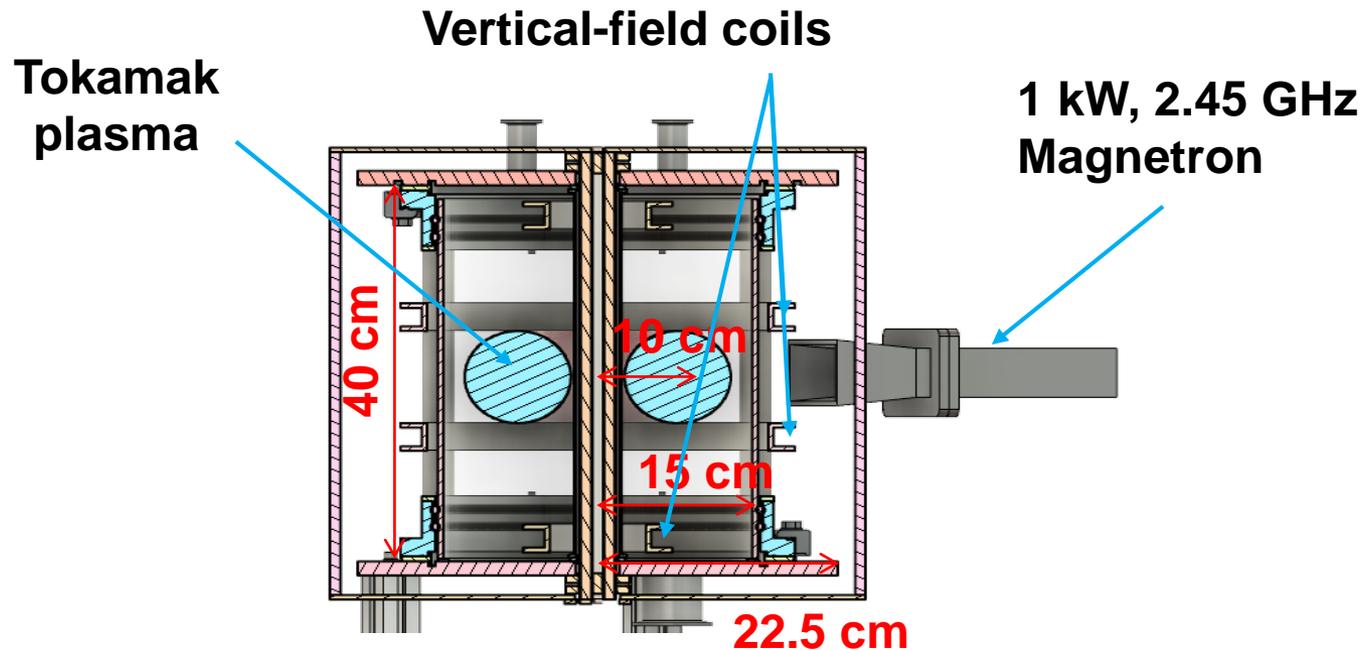
Material: <http://capst.ncku.edu.tw/PGS/index.php/teaching/>

Lecture 11

The prospective system design



- (1) Vertical field coil (VF coil): $B_v=12$ G w/ curvature of 5 cm.
- (2) Pulse forming network for driving VF coil: ? kA.
- (3) Rogowski coil for measuring plasma current: $I_p = 2$ kA.
- (4) Triple probe for measuring Plasma characteristics: $T_e \sim 1$ eV, $n_e \sim 10^{19} \text{ m}^{-3}$.



Grading



- 4 people in each team
- Grade by team (75 % of the final score)
 - Design presentation (15 %, i.e., 11.25 % of the final score)
 - Progress presentation (~~15~~**20** %, i.e., ~~11.25~~**15** % of the final score)
 - Final presentation (~~20~~**30** %, i.e., ~~15~~**22.5** % of the final score)
 - ~~– Experimental results (20 %, i.e., 15 % of the final score)~~
 - Final report (~~30~~**35** %, i.e., ~~22.5~~**26.25** % of the final score)
- Grade by person in each team (25 % of the final score)
 - Contribution of each person needs to be provided in each presentation and report.
 - The percentage of the contribution will be added to the final score.
 - Ex1: Contribution of 25 % of design presentation => 25x15% will be added to the final score.

Class schedule



Week	Progress Description
10	4/ 29 電漿量測
11	5/ 6 電漿量測/小組討論
12	5/ 13各組口頭報告設計
13	5/ 20 托克馬克各次系統實作設計
14	5/ 27 托克馬克各次系統實作設計
15	6/ 3 各組口頭報告進度 (20mins presentation+10 mins question)
16	6/10 托克馬克各次系統實作設計
17	6/17 托克馬克實作托克馬克各次系統設計
18	6/24 各組口頭報告實驗設計成果 (20mins presentation+10 mins question)

Discussion schedule



- **Virtual meeting link: <https://ppt.cc/fFzzlx>**
- **5/20**
 - **10:00 專題內容修正**
 - **10:30 Triple Langmuir probe**
 - **11:00 Vertical field coil**
 - **11:30 Rogowski coil**
 - **12:00 PFN**
- **5/27, 6/10, 6/17**
 - **10:00 Triple Langmuir probe**
 - **10:30 Vertical field coil**
 - **11:00 Rogowski coil**
 - **11:30 PFN**

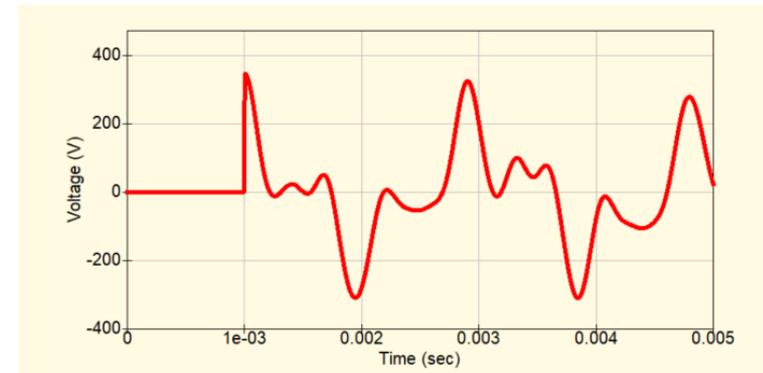
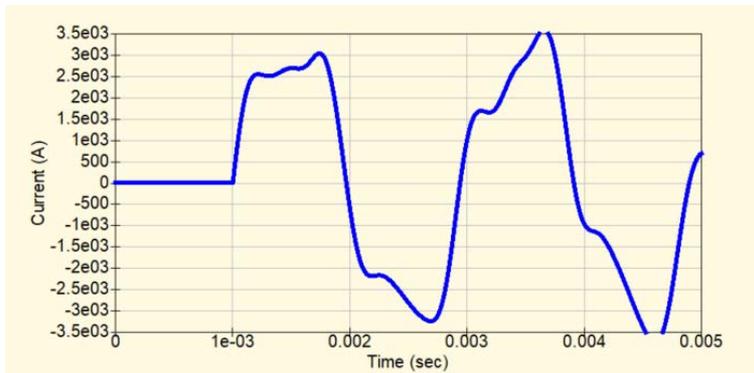
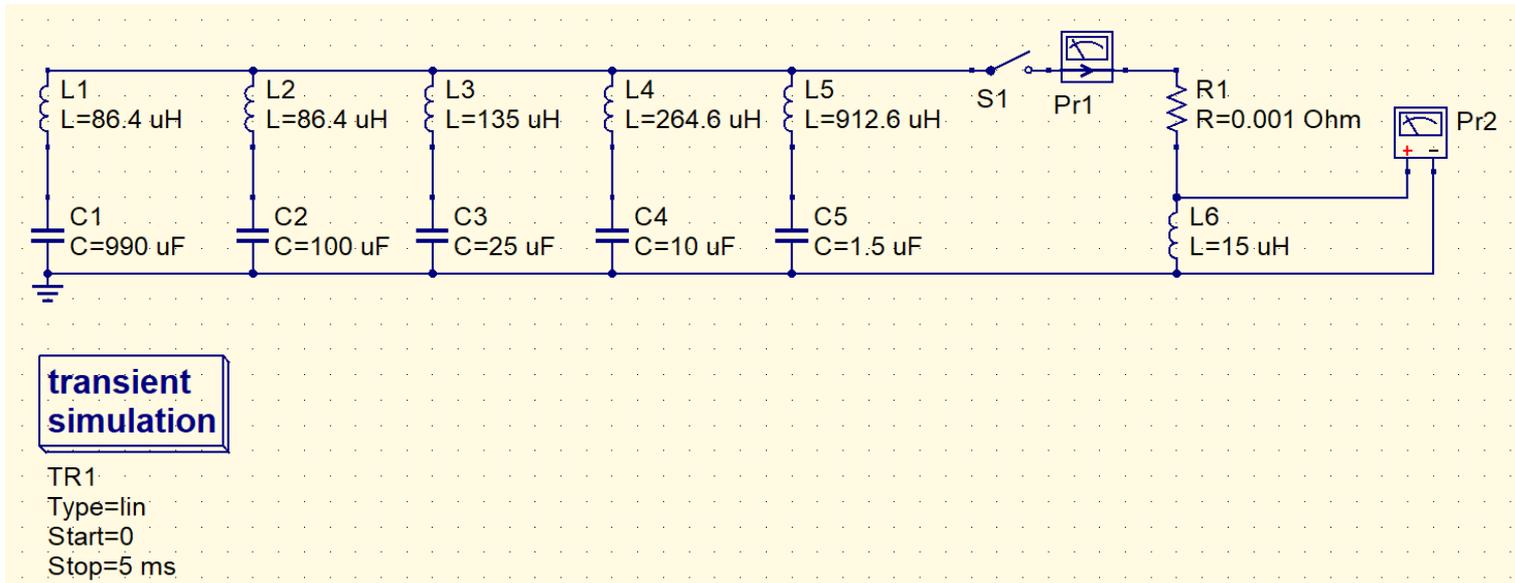
Design goal – people can implement your designs by only listen to your presentations or read your reports



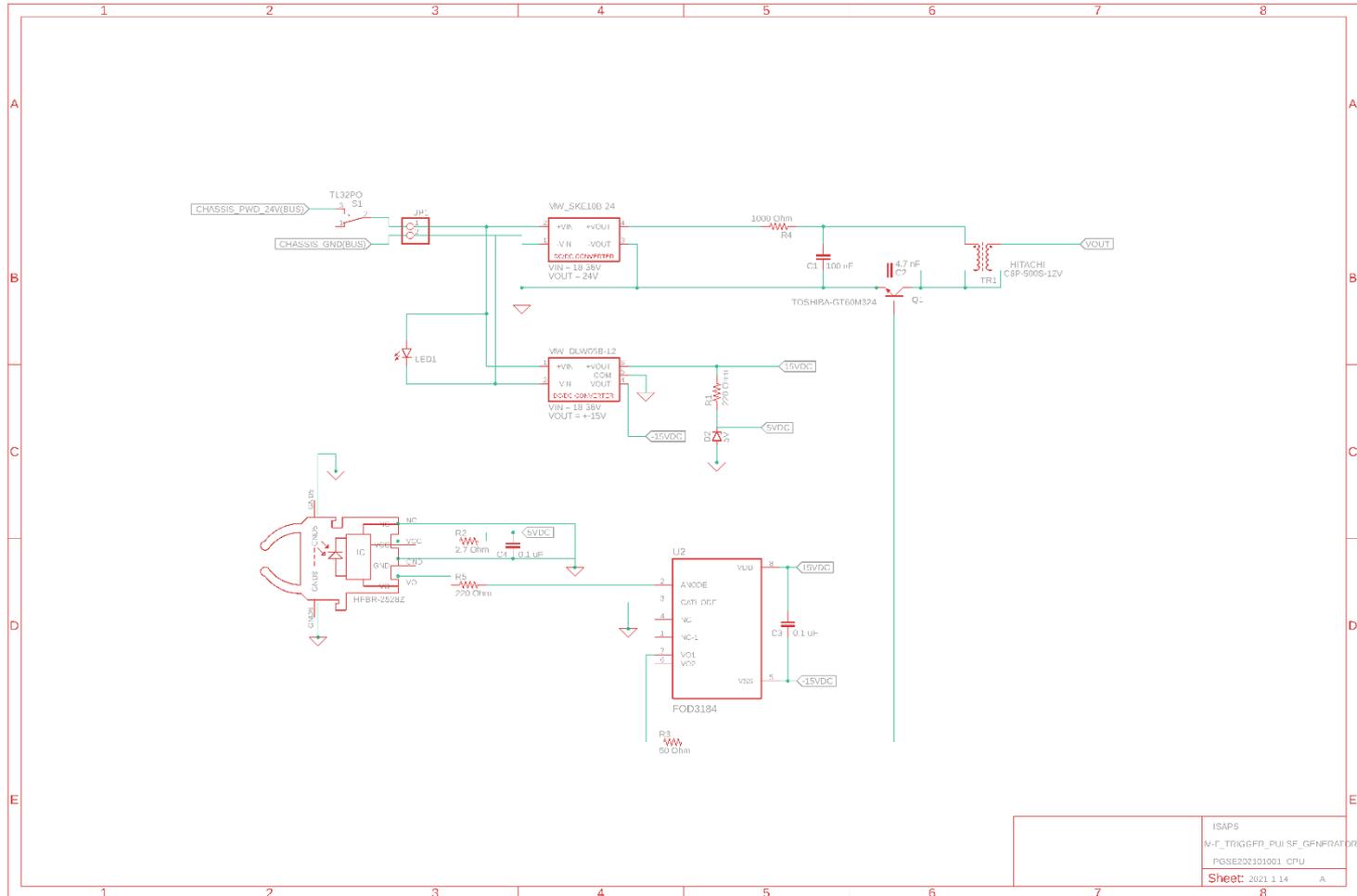
- Theory (conceptual design)
- Mechanical design (drawing needed)
- Circuit design
- Verification design

- Notes:
 - Chamber CAD/drawing files:
http://capst.ncku.edu.tw/PGS/Teaching/LA82300_Practice%20Course%20in%20Plasma/Drawing/
 - Drawing tools: Fusion 360 / Solidworks
 - Circuit simulation tool: qucs (<http://qucs.sourceforge.net/>)

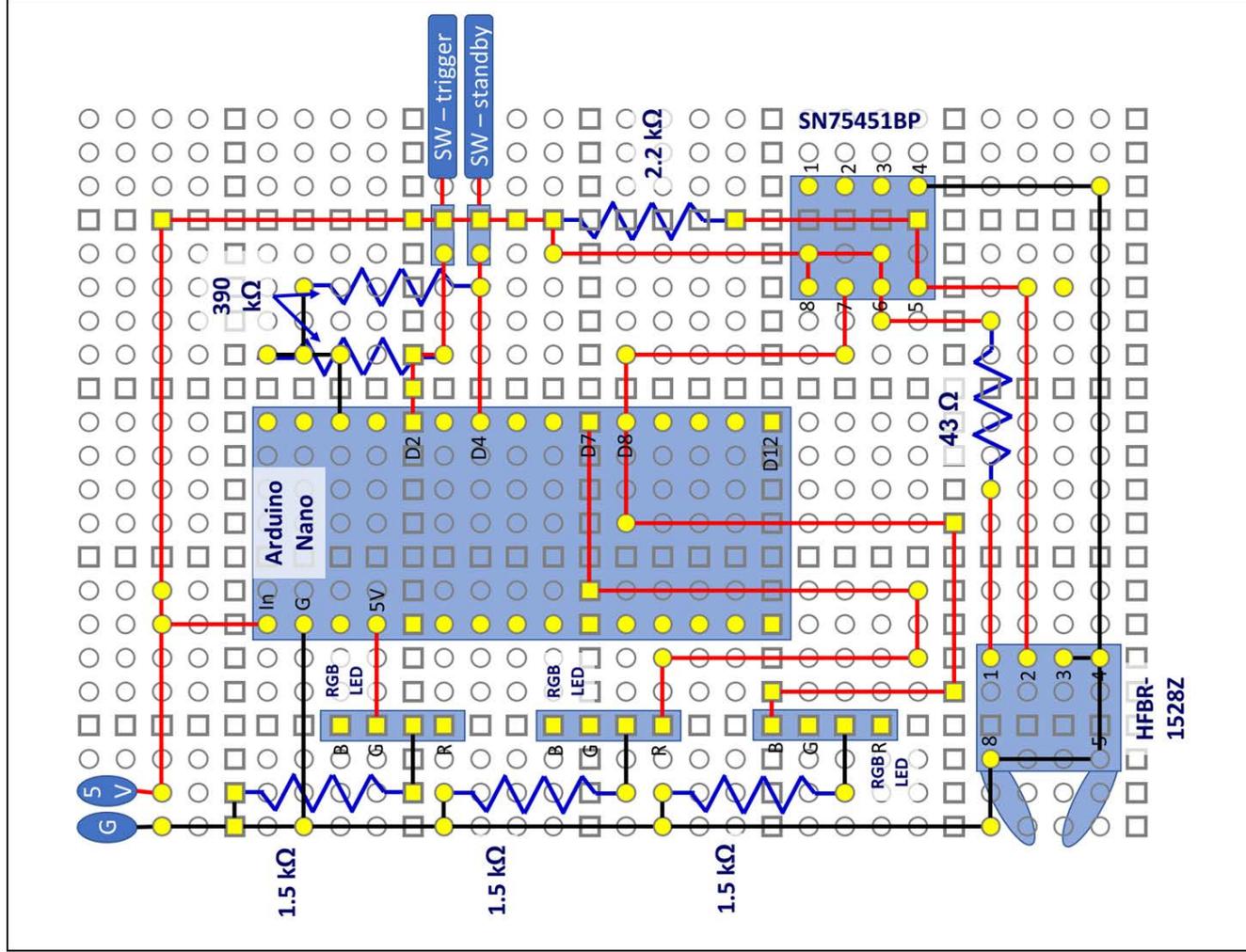
Example: spice simulation



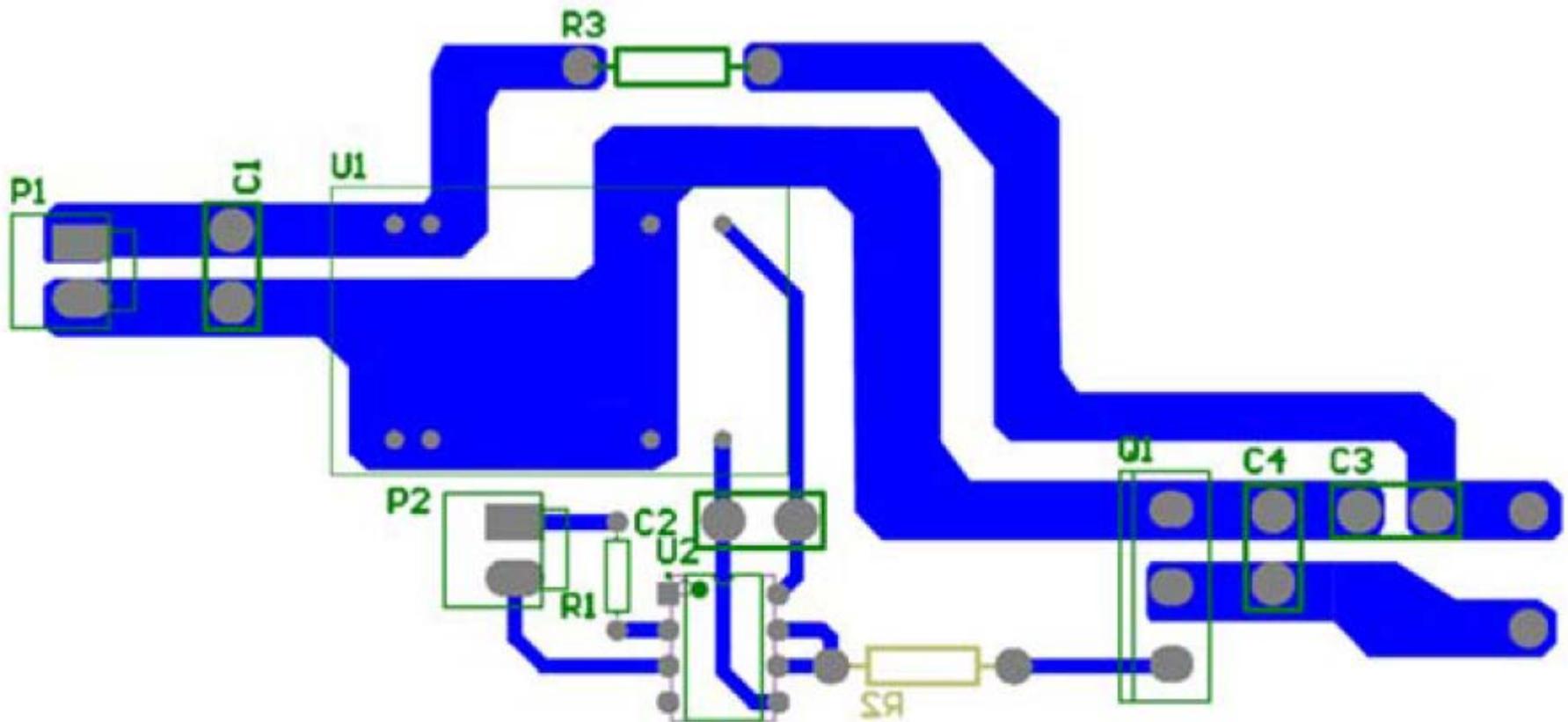
Example: Circuit model



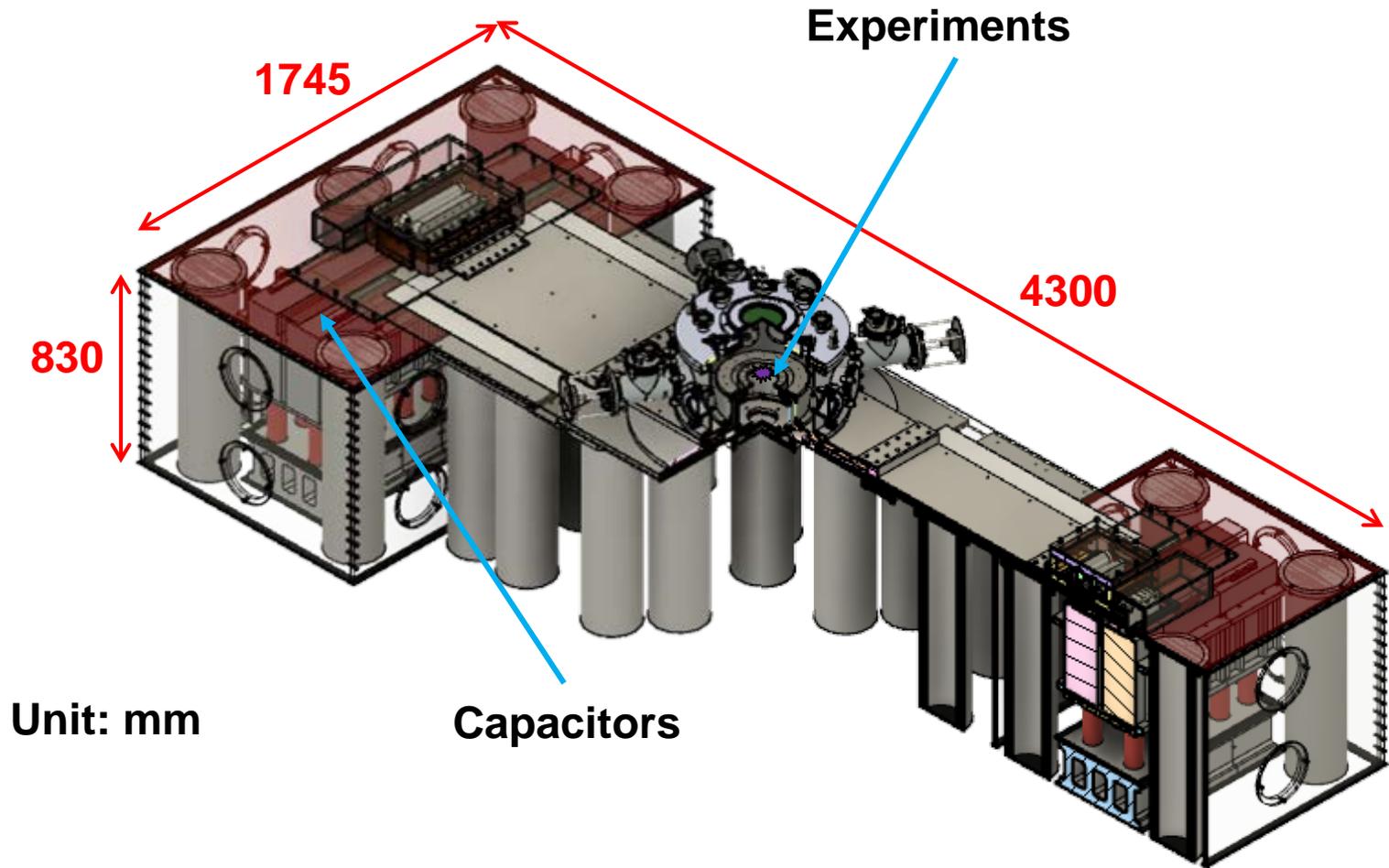
Example: Layout



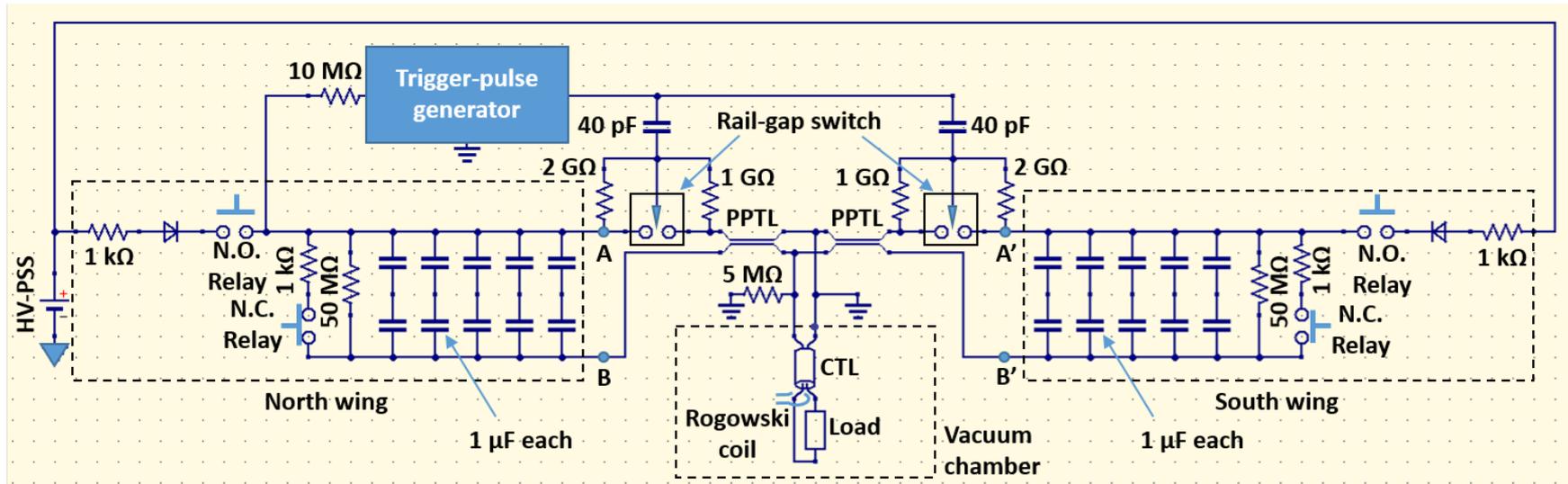
Example: Layout



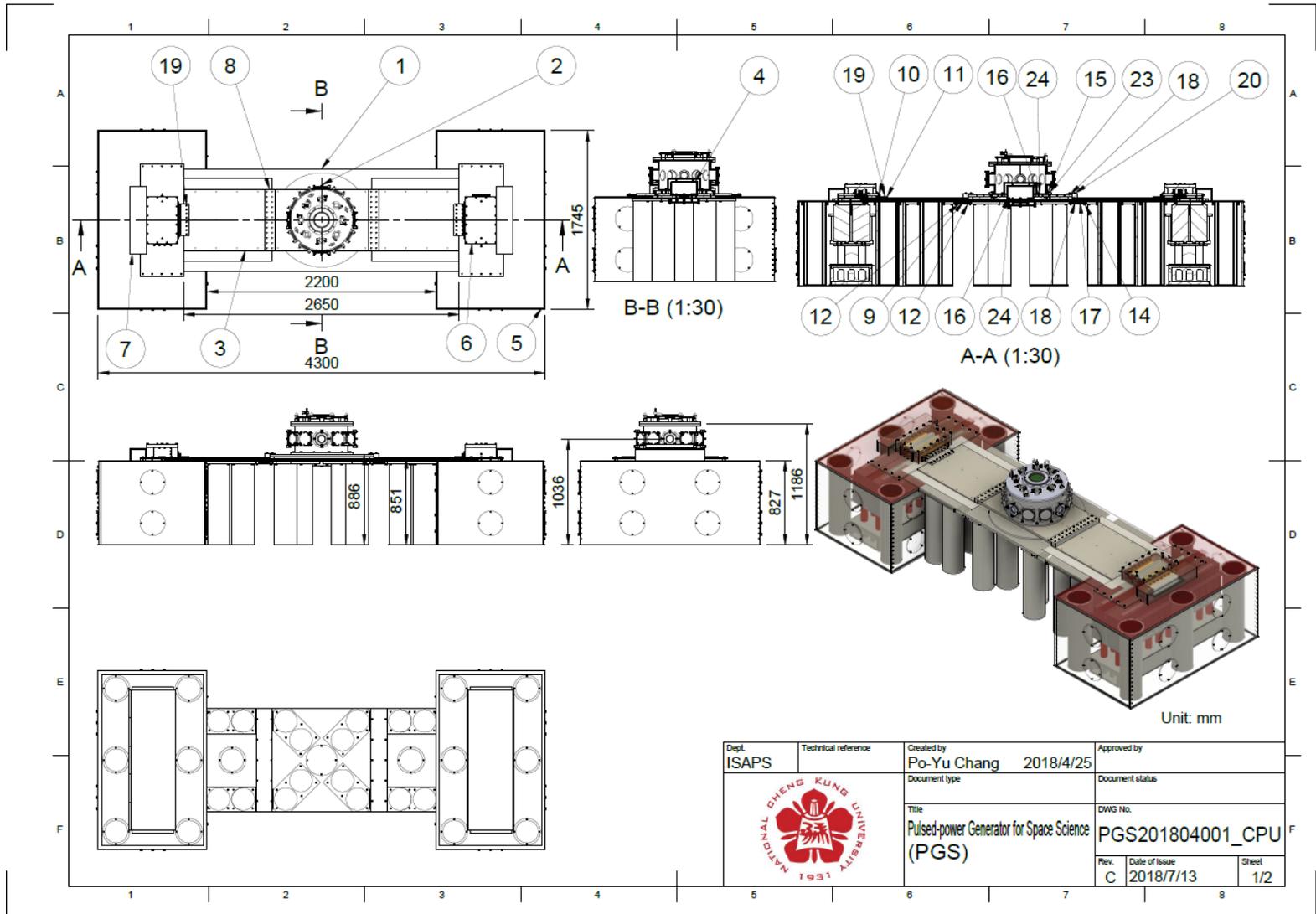
Example: system design



Example: circuit model

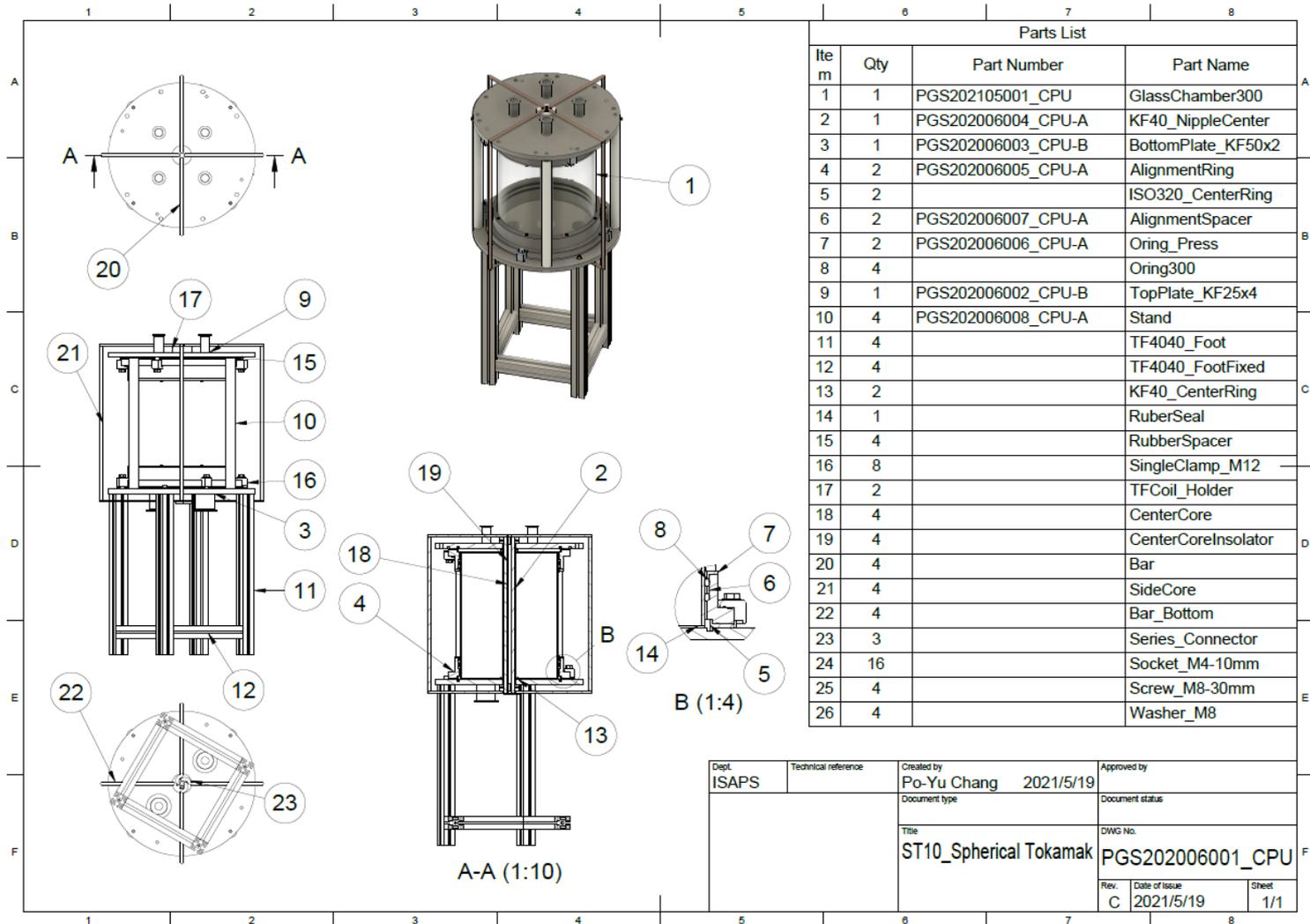


Example: mechanical drawing

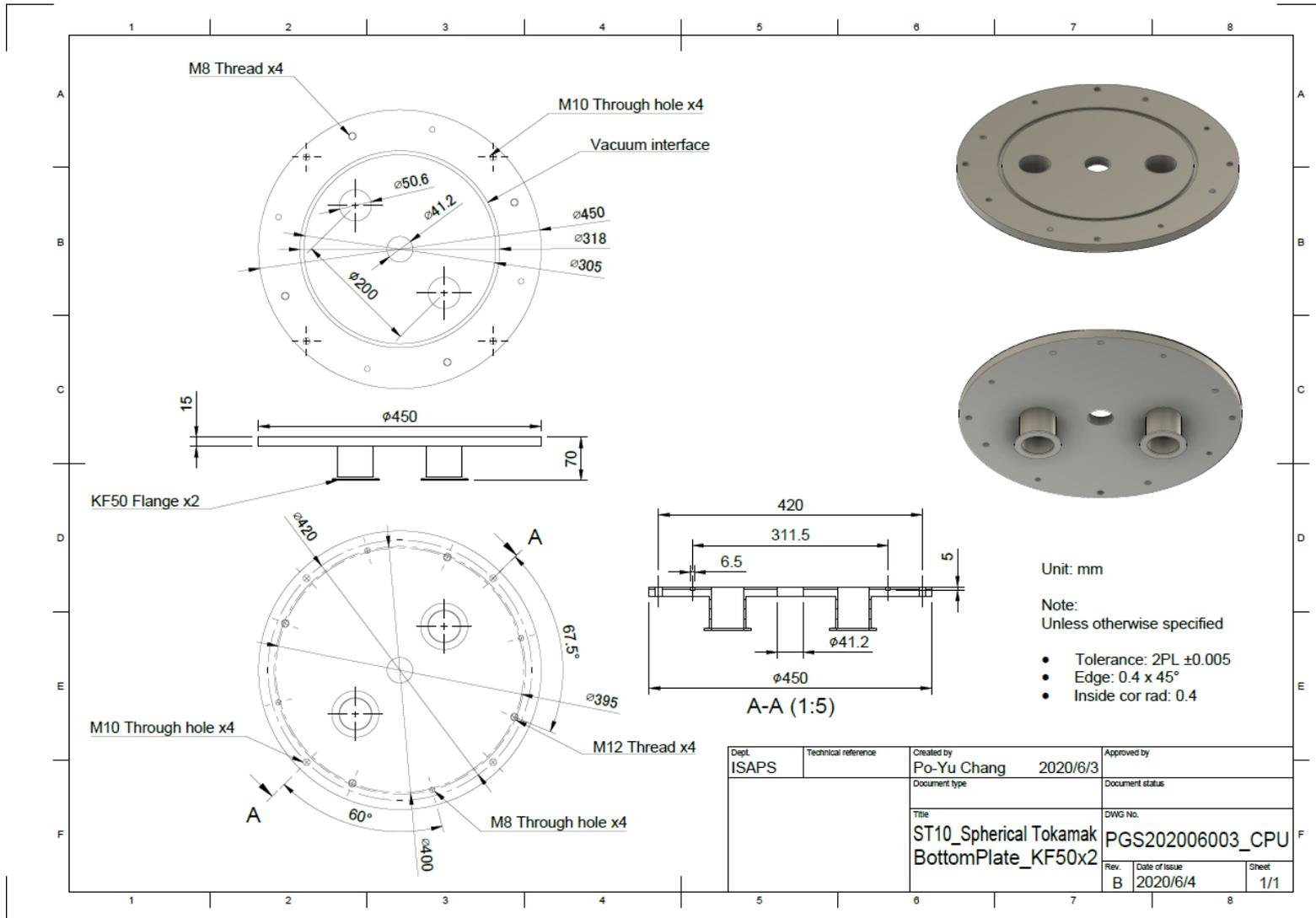


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Example: mechanical drawing



Example: mechanical drawing



Example: mechanical drawing

