TMS polarization monitor plan

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Motivations and References

- We need polarization monitor for TMS for
  - Monitoring polarization content inside the arm cavity
  - Measuring arm cavity round-trip loss correctly
    (see JGW-T2011633)
  - Searching for axion dark matter
    (see PRL 123, 111301 (2019), arXiv:2106.06800)

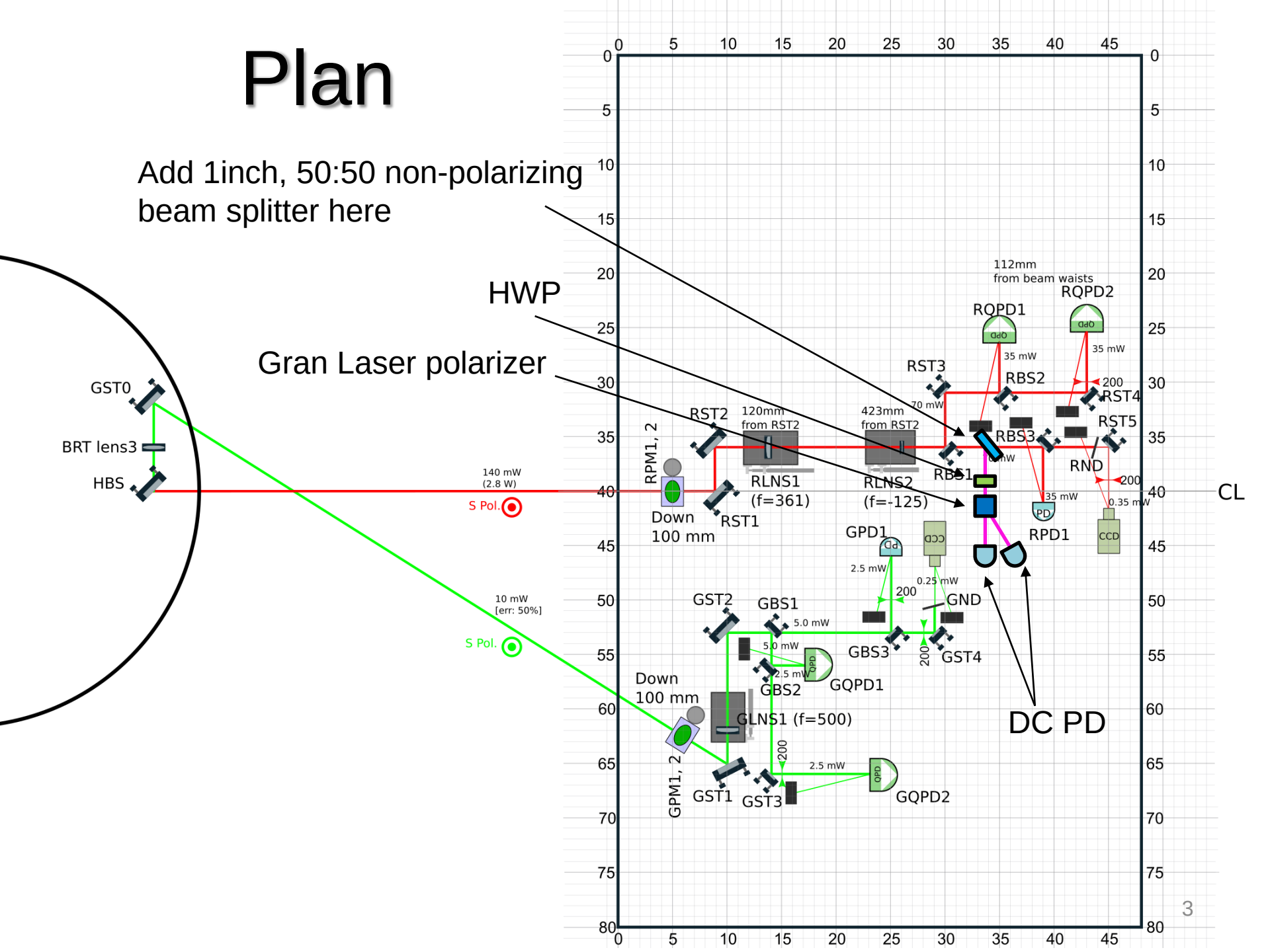
- References:
  - K. Nagano's GPT modification plan
    https://www.dropbox.com/s/w708wi3oc3el3gu/190421_GPTkaizou.pdf?dl=0
  - TMS in-air part (GPT part) optical layout JGW-T1808962

Plan

Add 1inch, 50:50 non-polarizing beam splitter here

HWP

Gran Laser polarizer



Considerations for the Plan

- Use Glan Laser polarizers which has a high extinction ratio
- Two photodiodes for s-pol and p-pol to differentiate power fluctuation and polarization fluctuation
- Modification as small as possible, consider space available at the TRX/TRY table

Items to Purchase

- Qty for TRX and TRY

Description	Company	Part number	Qty.	Comment
HWP	Newport	10RP32-1064	2	1inch
HWP mount	Newport	RM25A	2	
Polarizer	Sigma-Koki	GLPB2-10-25.9SN-7/30	2	High extinction ratio
Non-polarizing beam splitter	Sigma-Koki	NPPH(+/-5%)Q-25.4C06-20-W0.5D-1064	2	1 inch, already delivered JGW-D2112956
1inch mirror mount	Newport	SN100C-F2K	4	For polarizer and NBS
1inch mirror mount & HWP mount pole	ISAS/JAXA	JGW-D1808429 66.2 mm	6	Should be some spares there
Base plate	Thorlabs	BA2T2/M	6	
PD	Thorlabs	PDA100A2	4	For s-pol and p-pol
PD post	Thorlabs	TR75/M-JP	4	
PD post holder	Thorlabs	UPH50/M	4	Swiveling magnetic base post holder