Visible Light Cavity Mode Matching Telescope - Remastered

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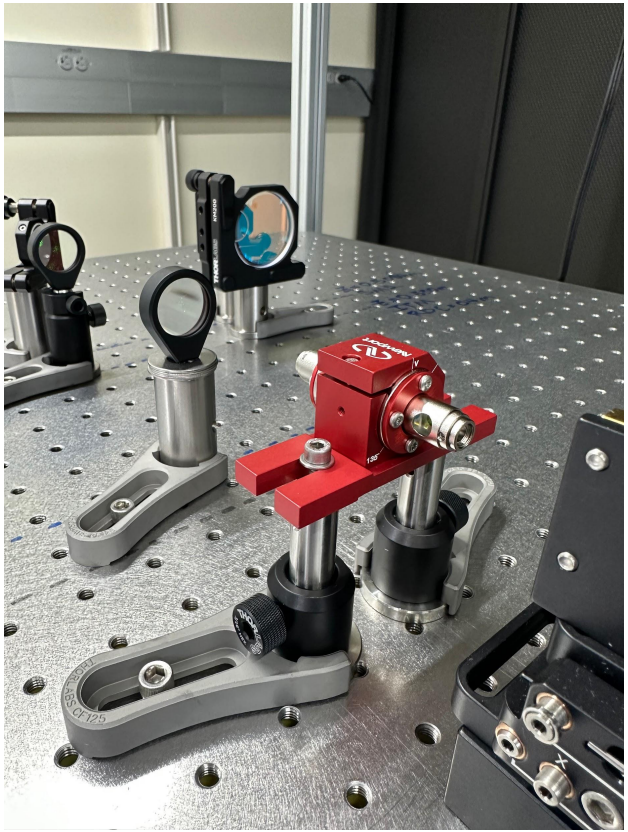
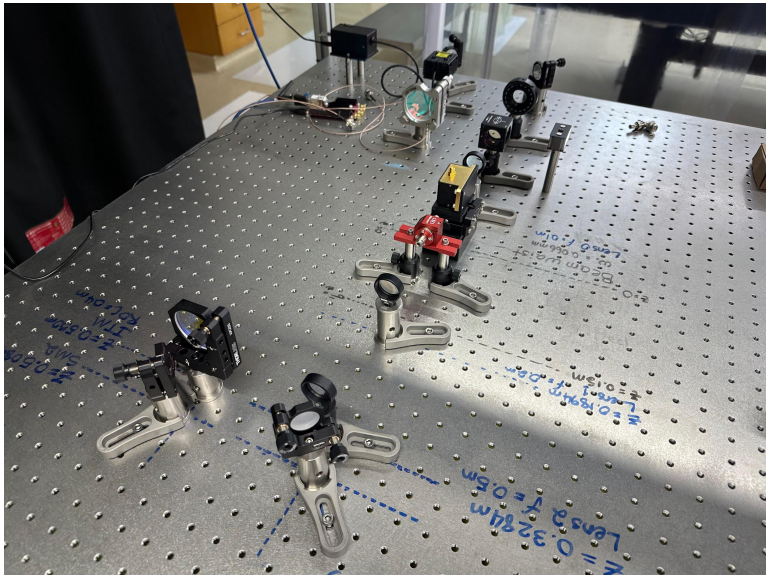
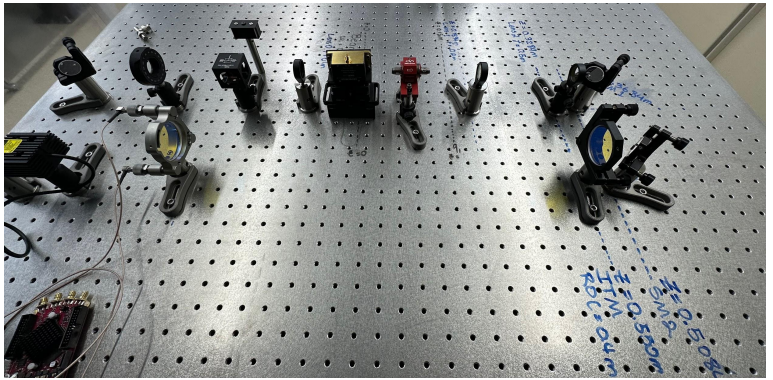
Current Configuration

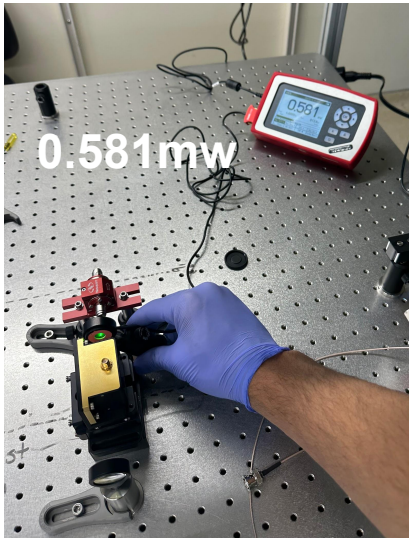


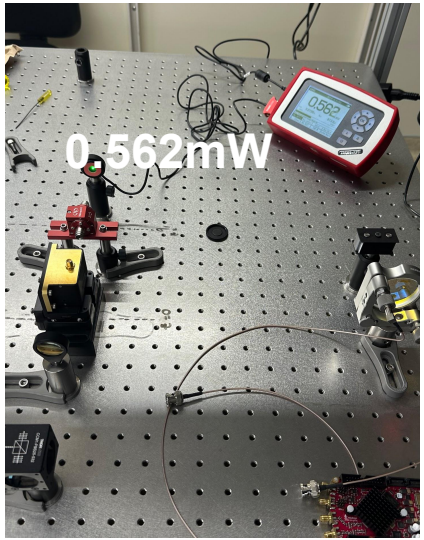


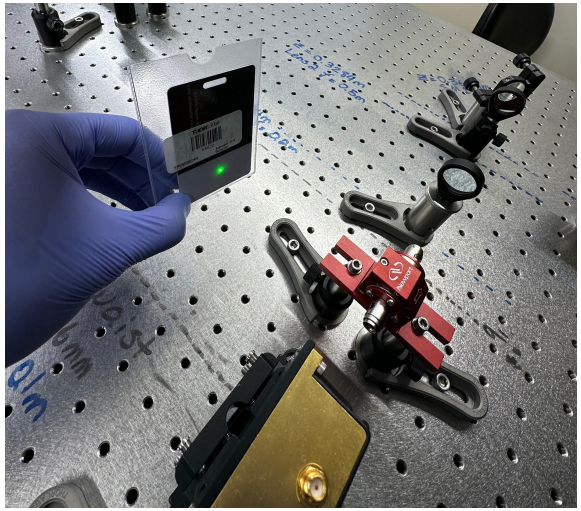


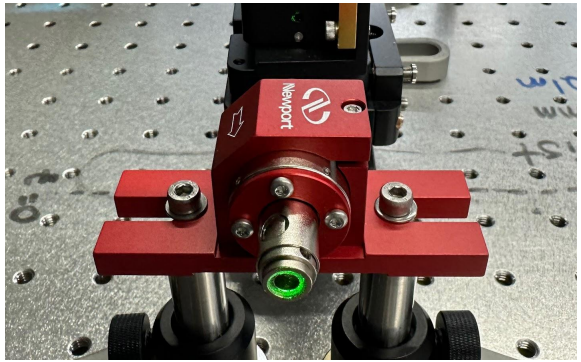
New Faraday Isolator

- Used Power meter to align correctly
- 3.27% loss



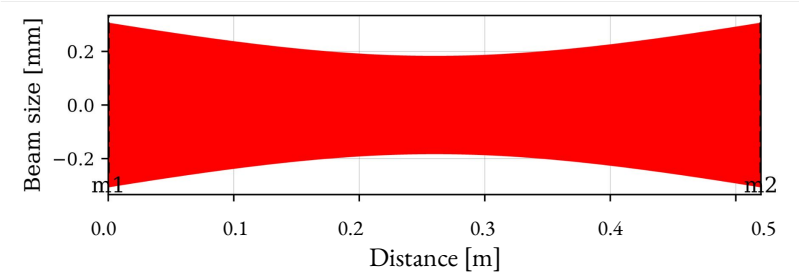


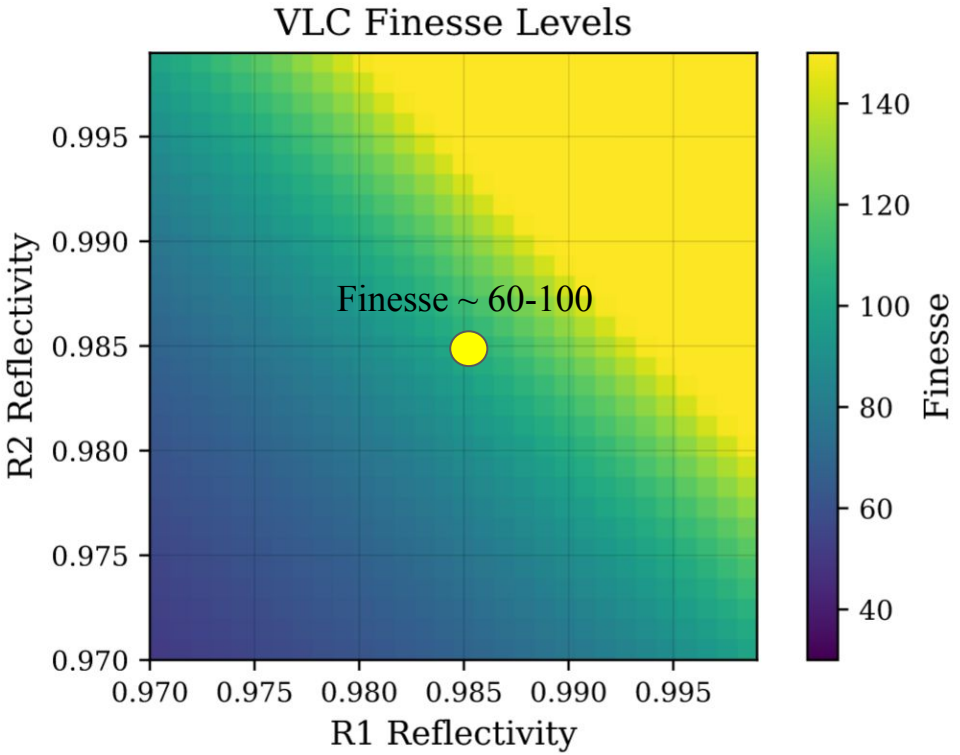




Maximum Circulating Power

If we just model the cavity with the known parameters, for 1W, the maximum circulating power is:
65.67W

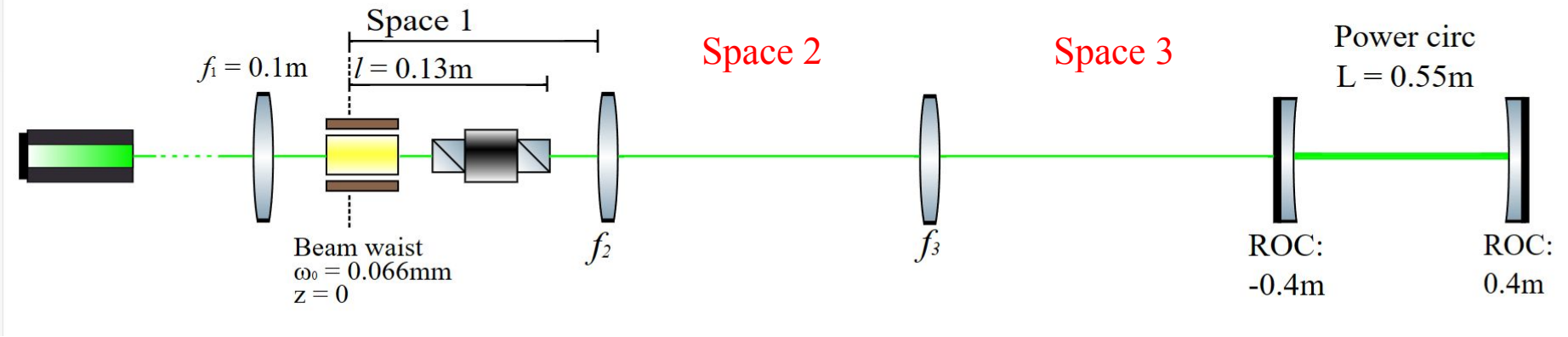




Mode Matching Telescope Layout

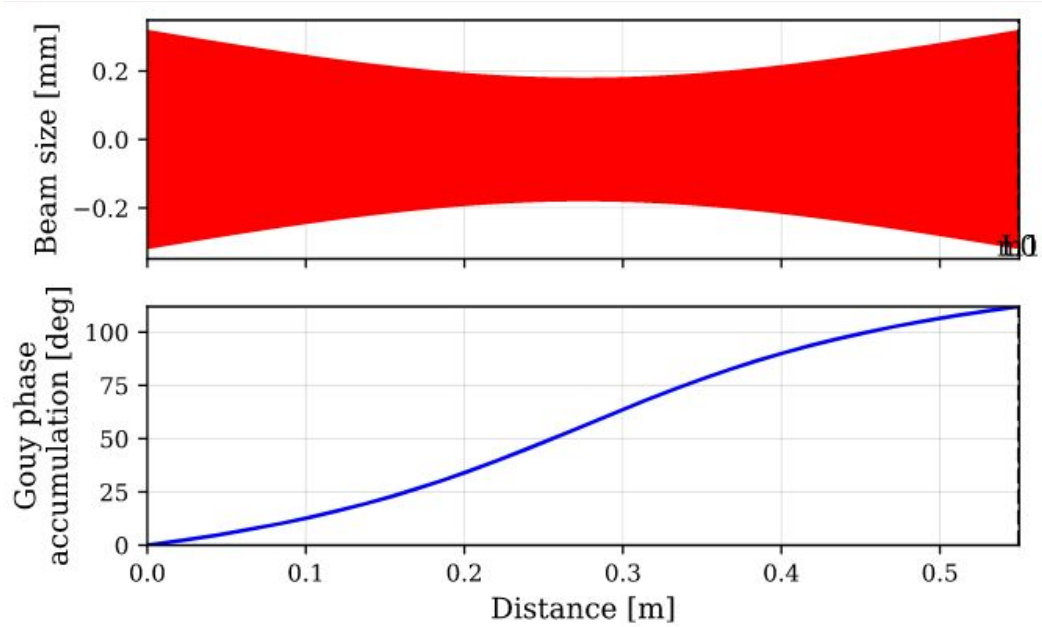
A La Mode Code:
- Initial q = 0 + 0.0257i
- Target q = 0.275 + 0.1854i
- Starting z = 0.00m
- Target z = 0.45m

FINESSE:
- Initial q: 0 + 0.0257*i*
- Target Beam width: 0.317mm



Cavity Parameters: FINESSE

- Defined a cavity in FINESSE string with
  - ITM ROC = 0.4m
  - ETM ROC = 0.4m
  - Length = 0.55m
  - λ = 532nm
  -
- Parameters consistent with manual ABCD calculations



	z	w0	zr	w	RoC	Acc. Gouy	q
m2.p1.o	0 m	177.19 um	185.4 mm	316.97 um	-400 mm	0°	-0.275 + 0.185j
m1.p2.i	550 mm	177.19 um	185.4 mm	316.97 um	400 mm	112.02°	0.275 + 0.185j
m1.p1.o	550 mm	177.19 um	185.4 mm	316.97 um	400 mm	112.02°	0.275 + 0.185j
L0.p1.i	550 mm	177.19 um	185.4 mm	316.97 um	400 mm	112.02°	0.275 + 0.185j

Mode Matching Solution

A La Mode Output:

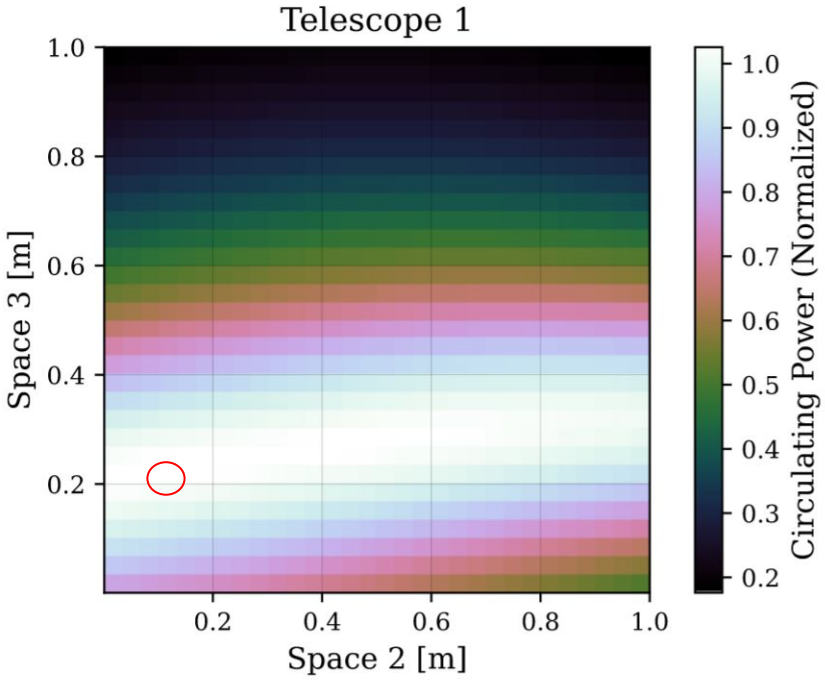
Component	z [m]	Parameter
Lens 1	0.1898	**f = 0.2m**
Lens 2	0.3284	**f = 0.5m**
ITM	0.5497	ROC: -0.40m

Sensitivity: 20.065

Overlap: 1.000

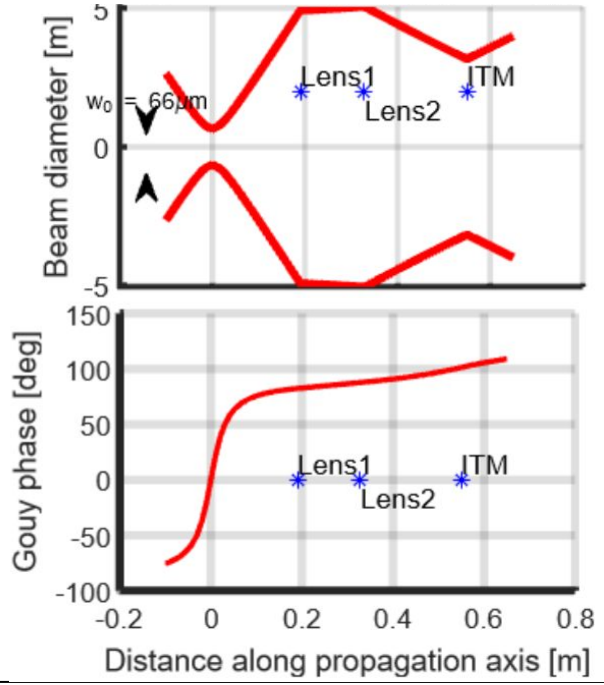
Components only defined up to ITM

FINESSE Output



Beam Profile Comparison

A La Mode



FINESSE