



KAGRA Input/Output Optics

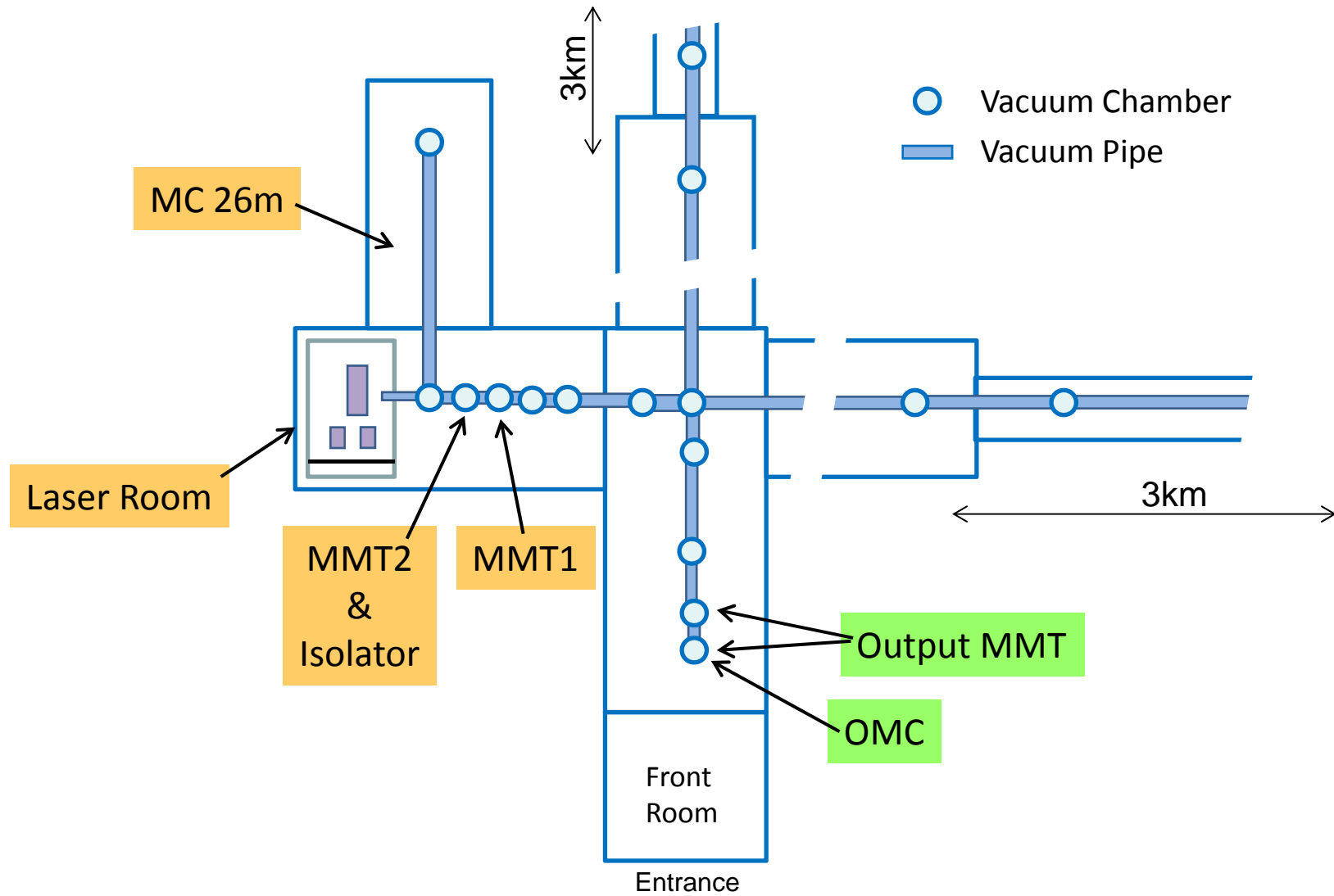
KAGRA 入出射光学系 I/O Optics System for KAGRA

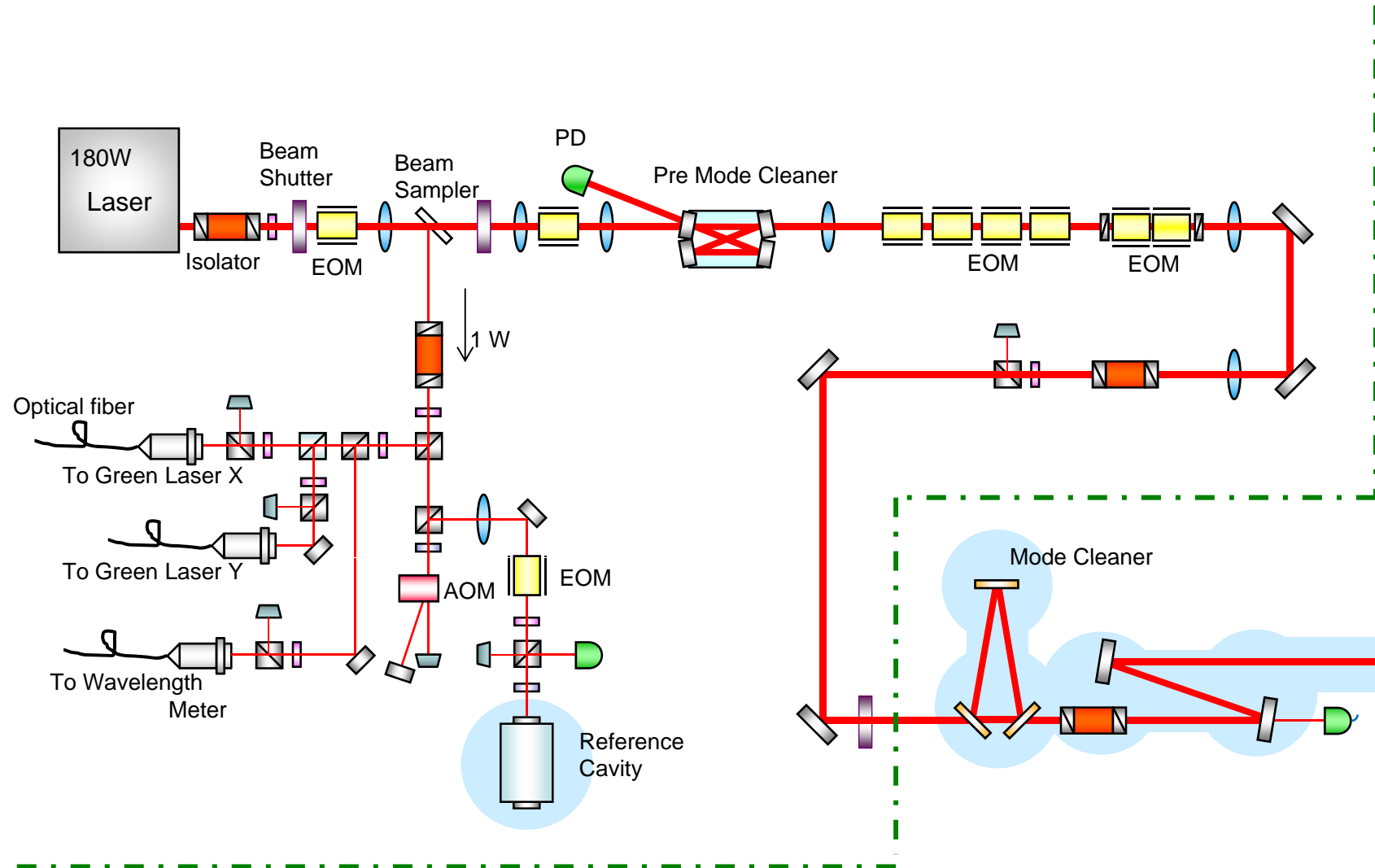
産業技術総合研究所・寺田聡一
Souichi Telada (AIST)

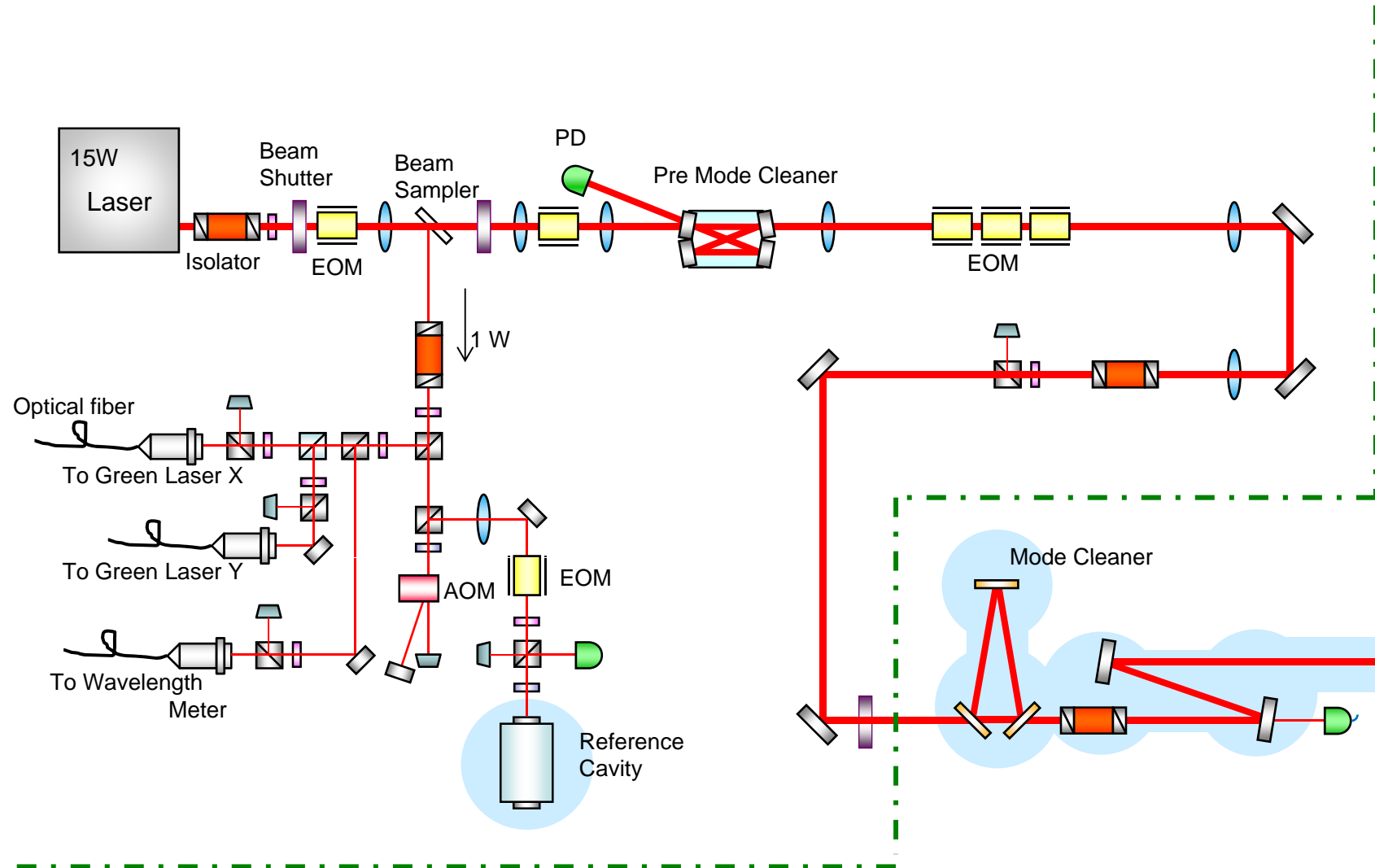
Contact: Souichi TELADA <souichi.telada@aist.go.jp>

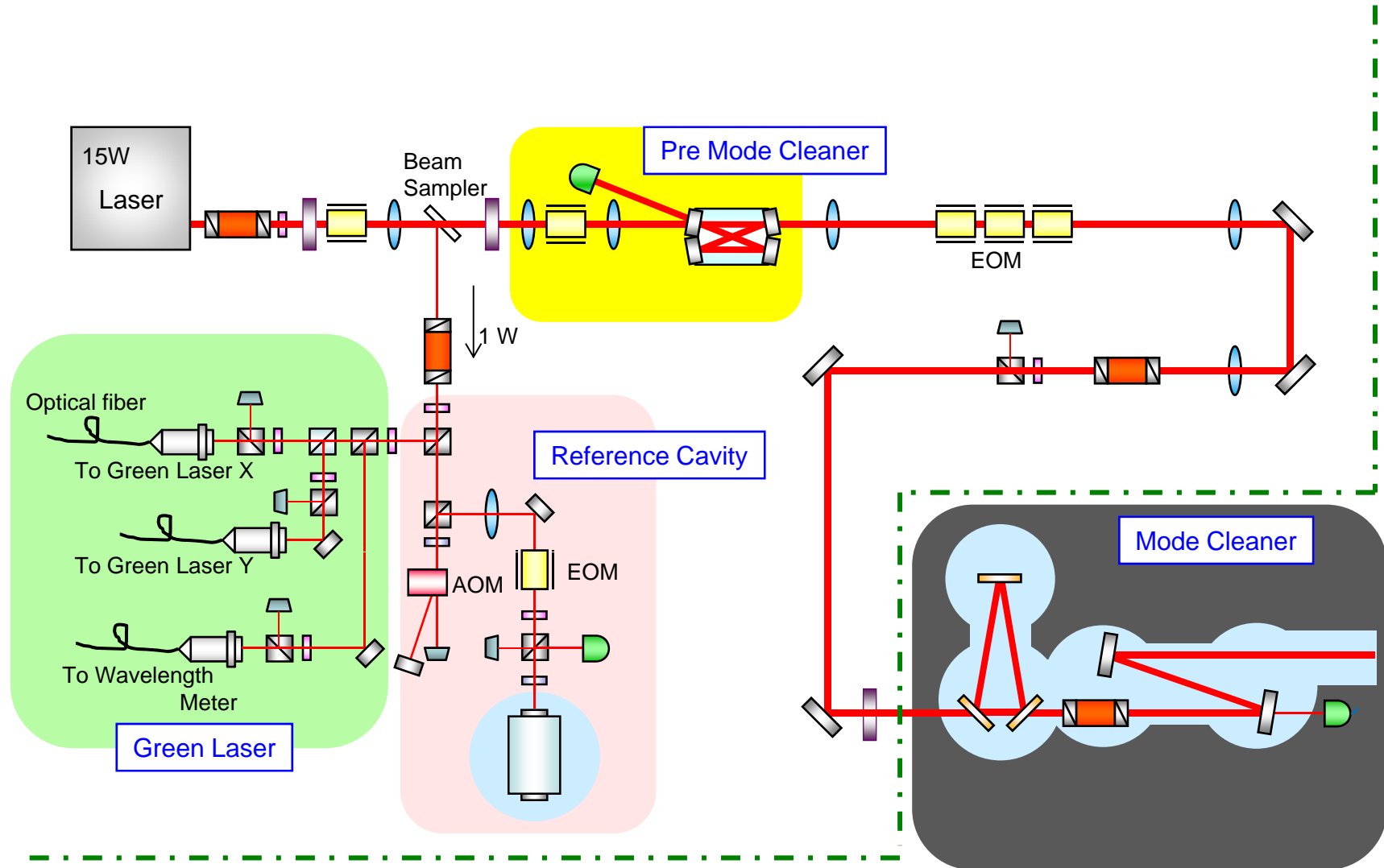


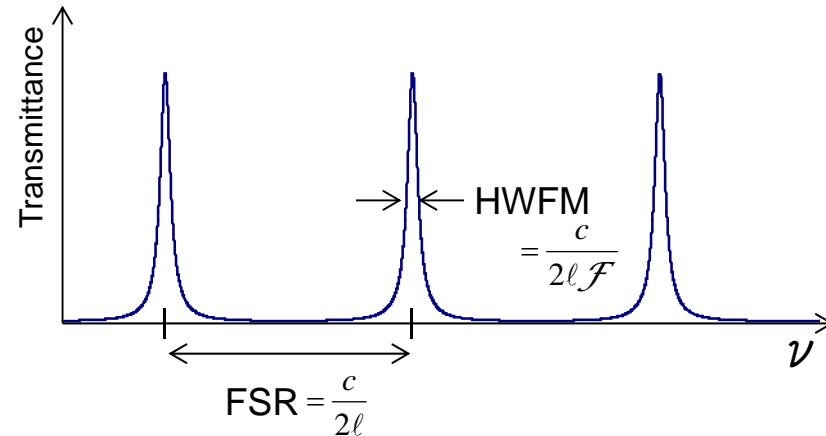
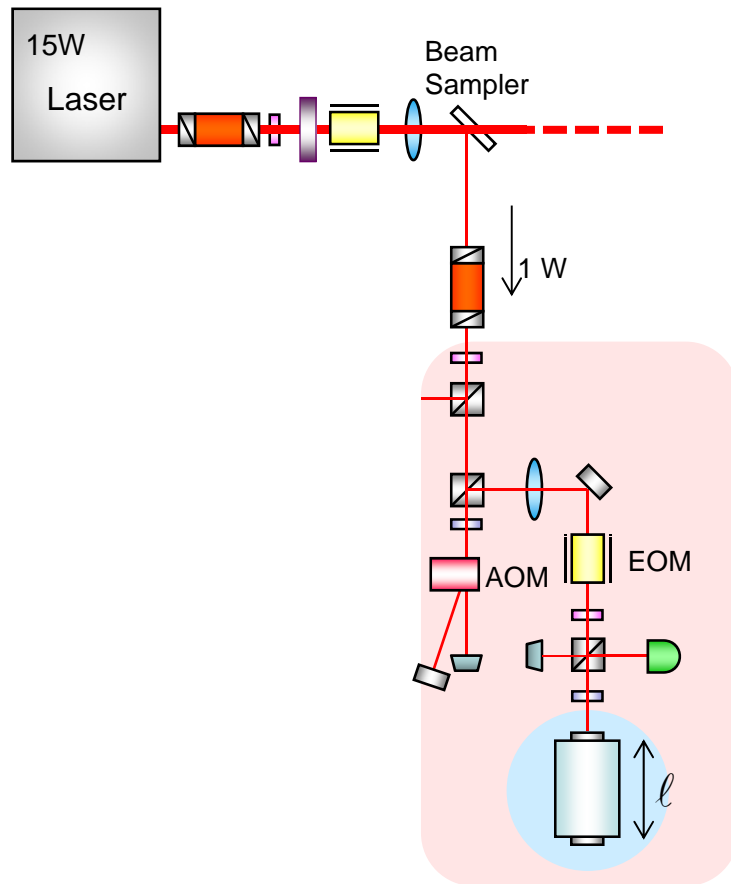
センタールーム配置 / Overview of Layout







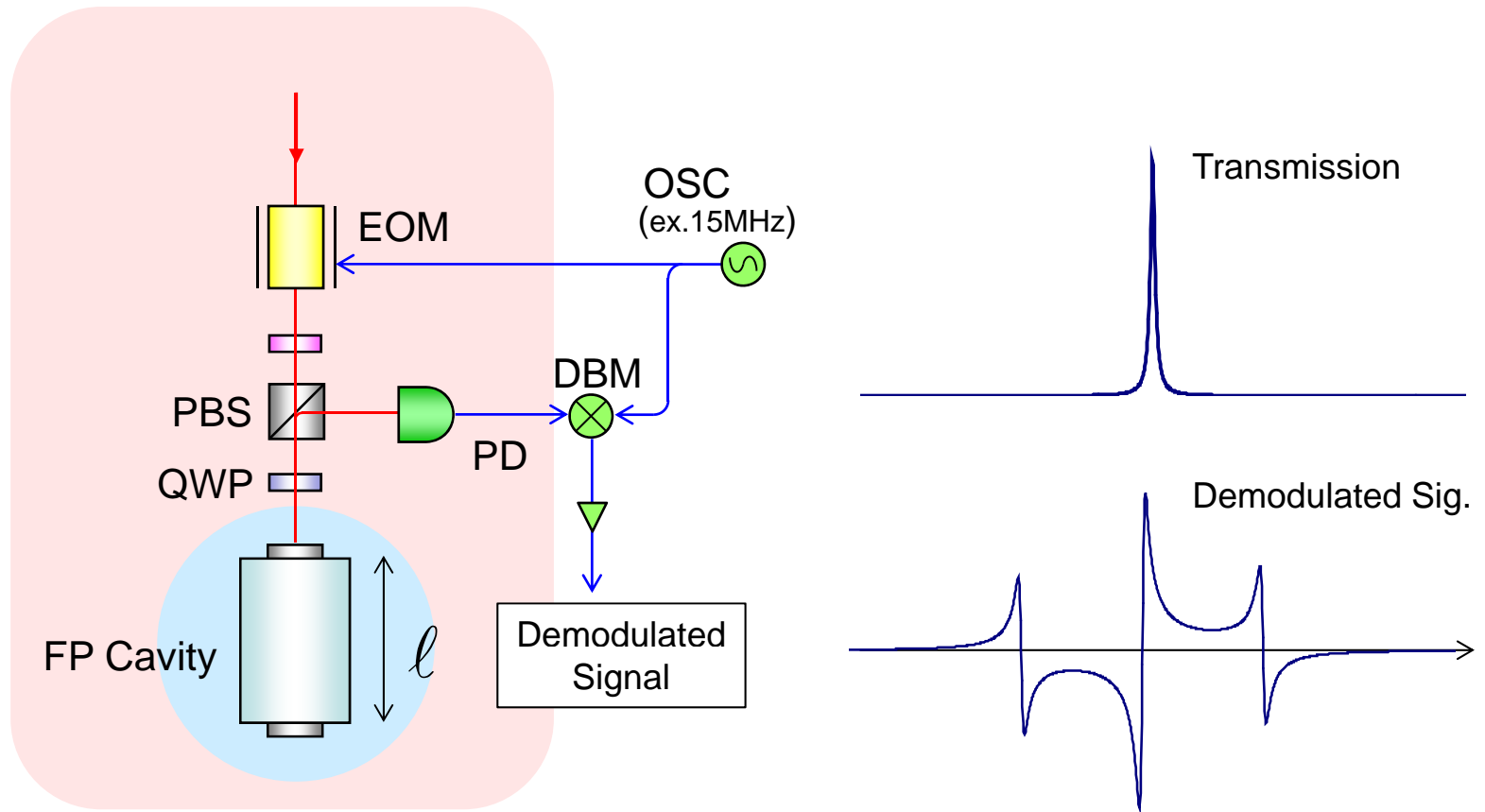


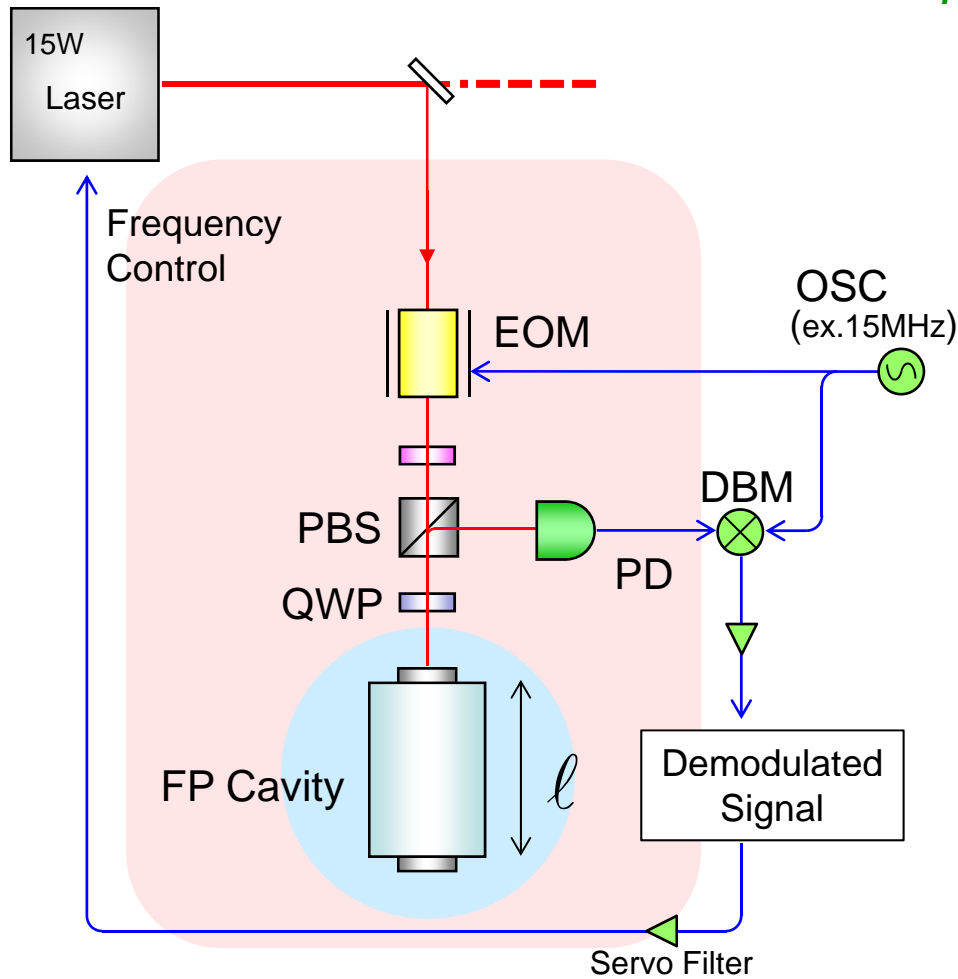


FSR: Free Spectral Range

\mathcal{F} : Finesse (depend on reflectance of cavity mirrors)

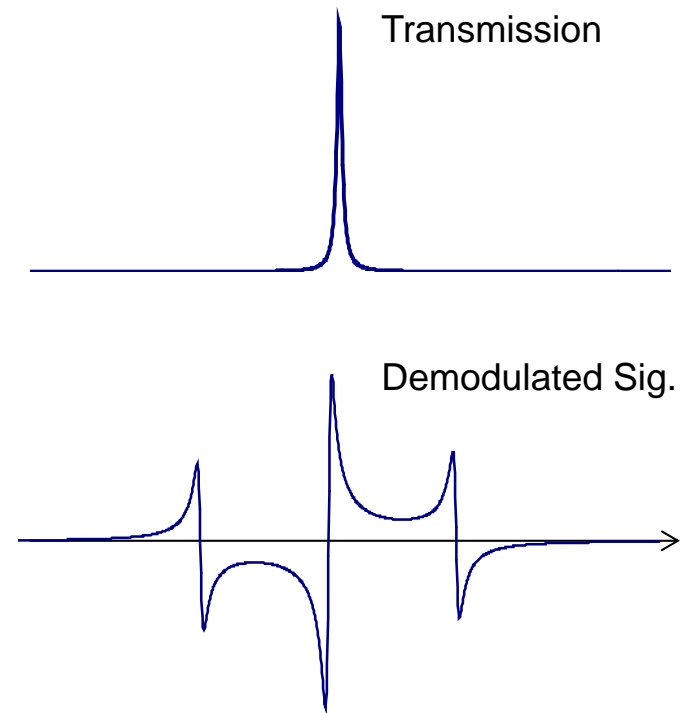
l	FSR	R_1	R_2	\mathcal{F}
0.1 m	1.5 GHz	99.99%	99.99%	30000
0.975 m	154 MHz	98 %	98 %	155
26.6 m	5.625 MHz	99.37%	99.37%	500
3 km	50 kHz	99.6%	99.9945%	770

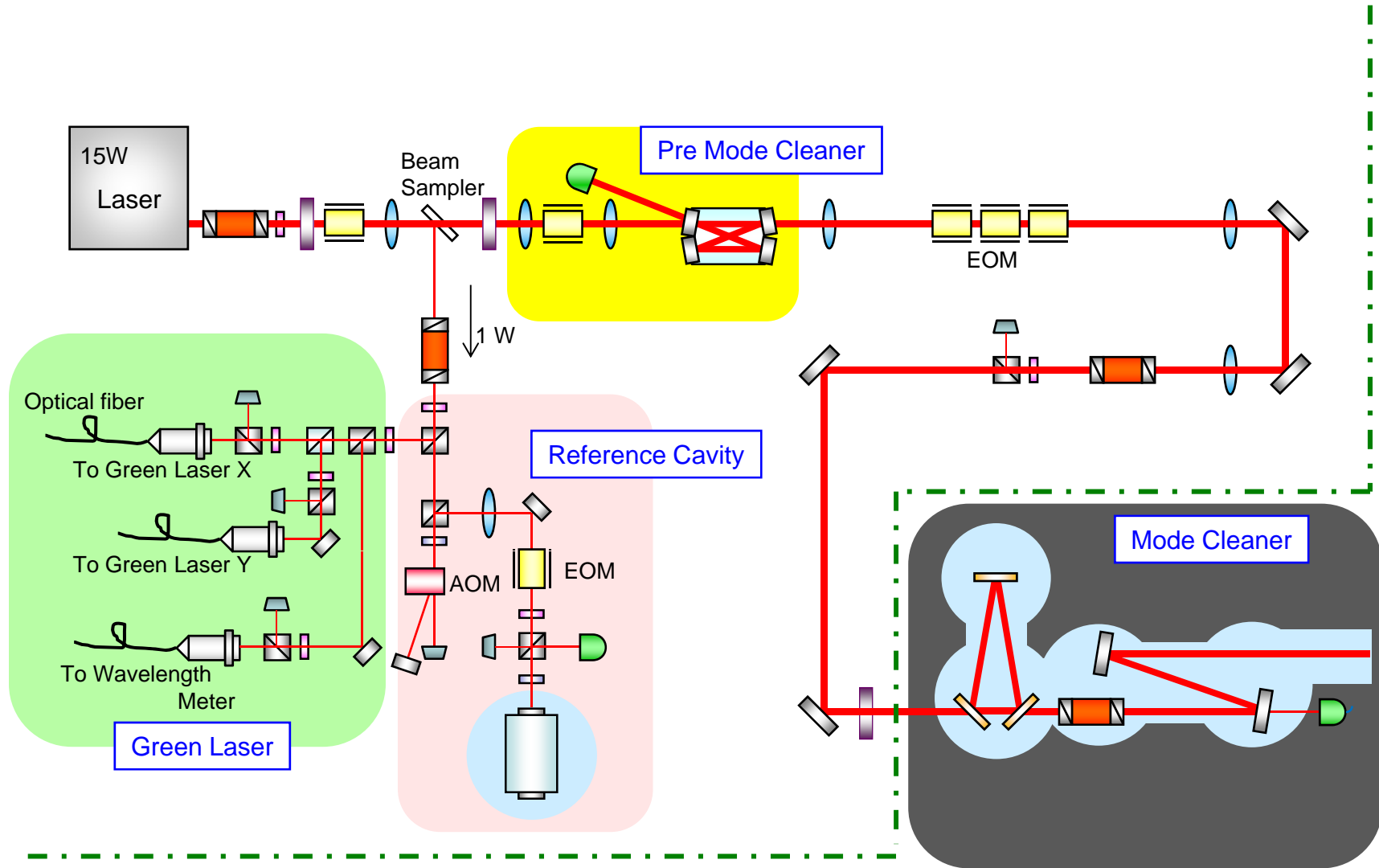


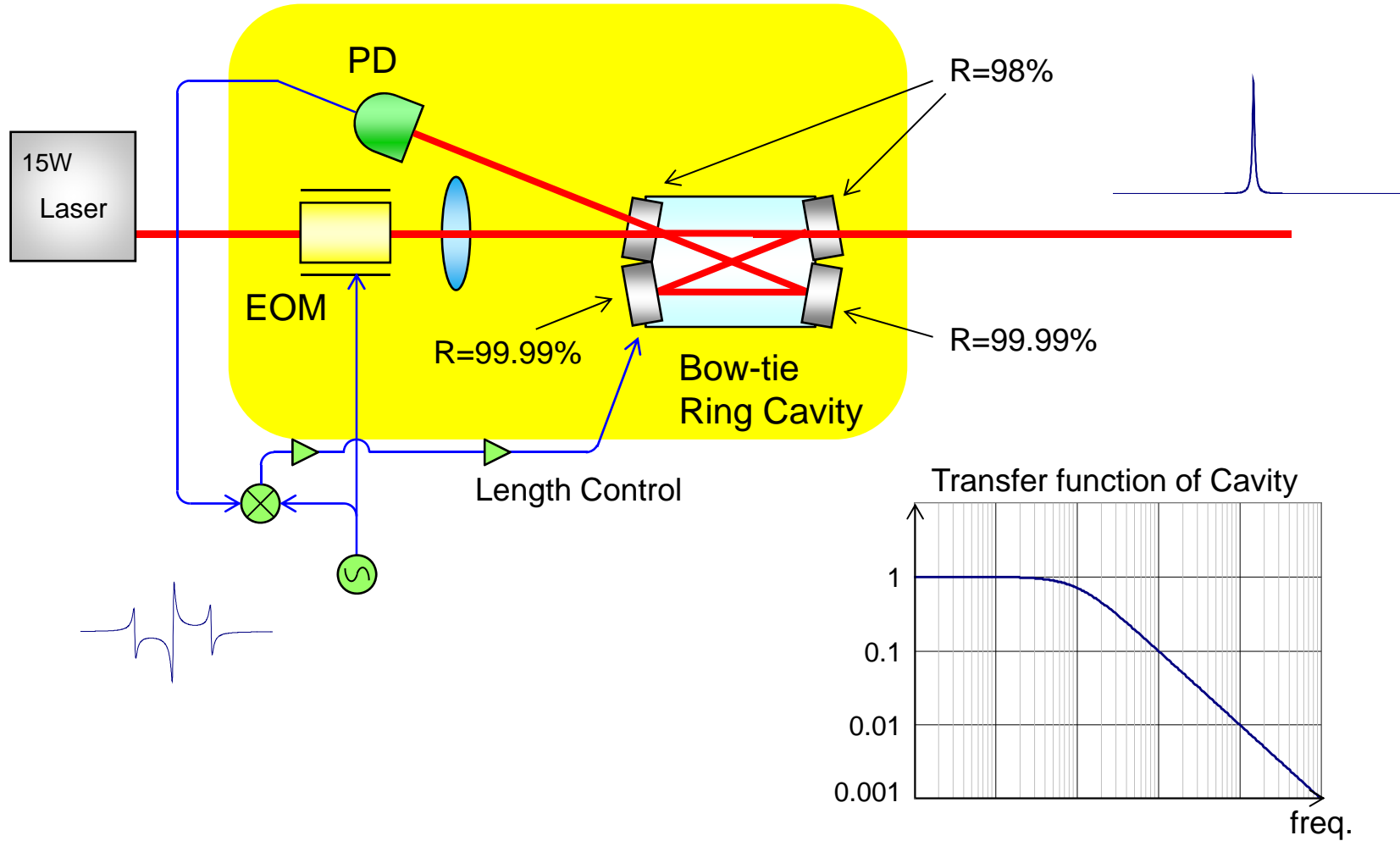


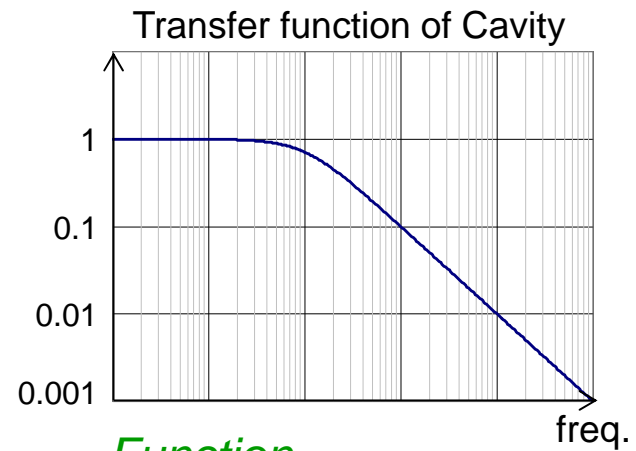
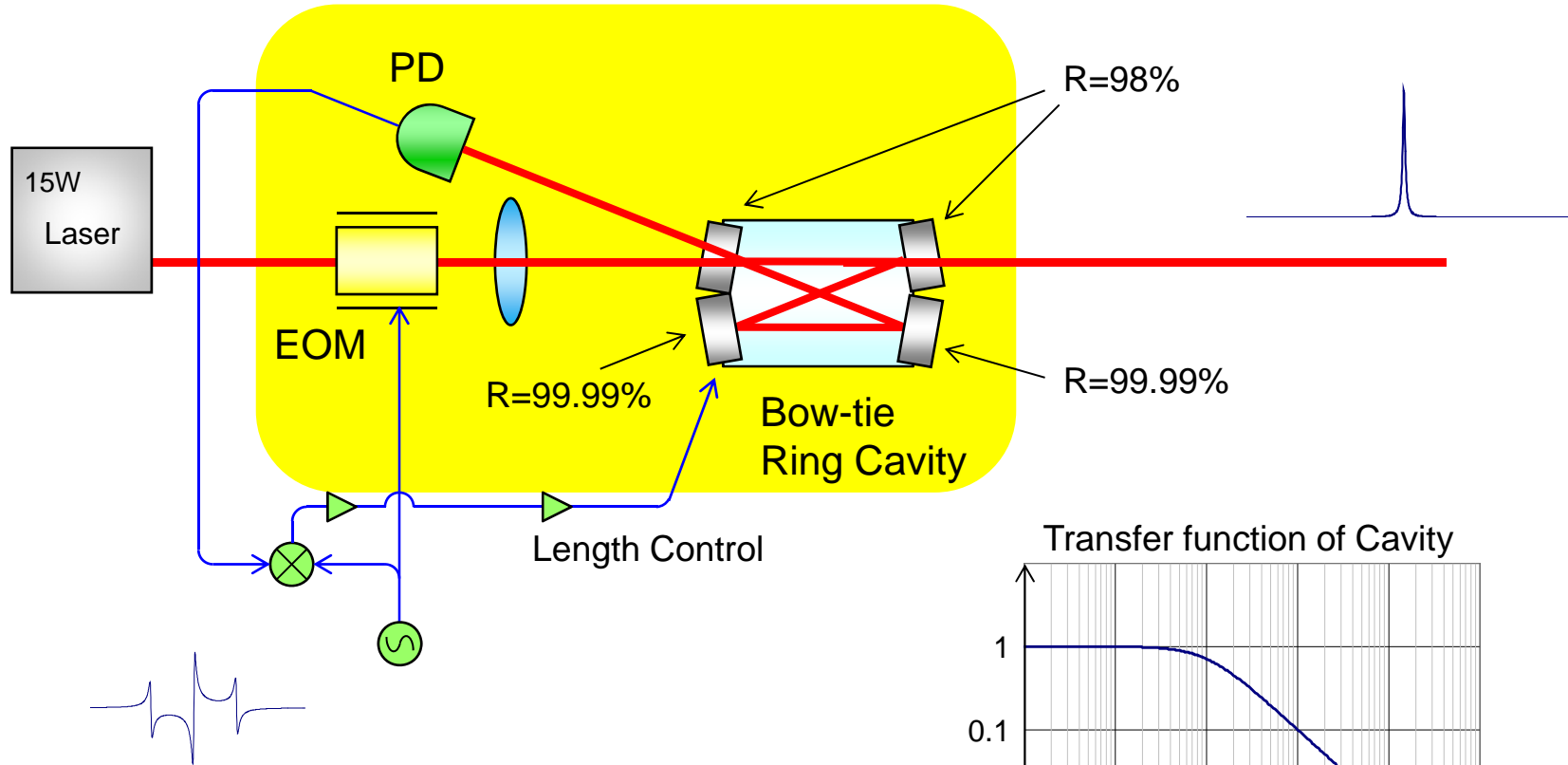
Function

- Laser Frequency Stabilization
- Lower Frequency Reference

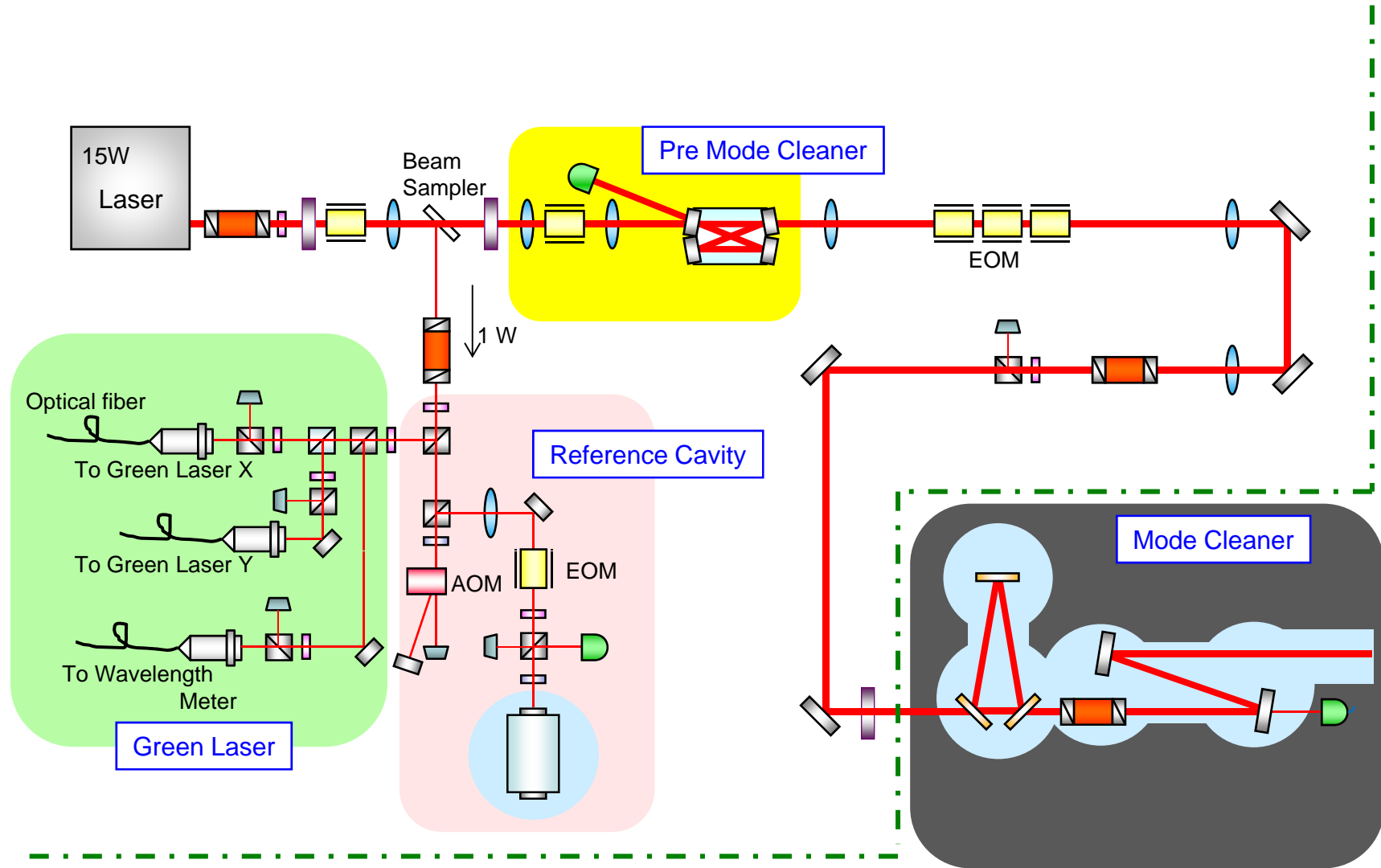


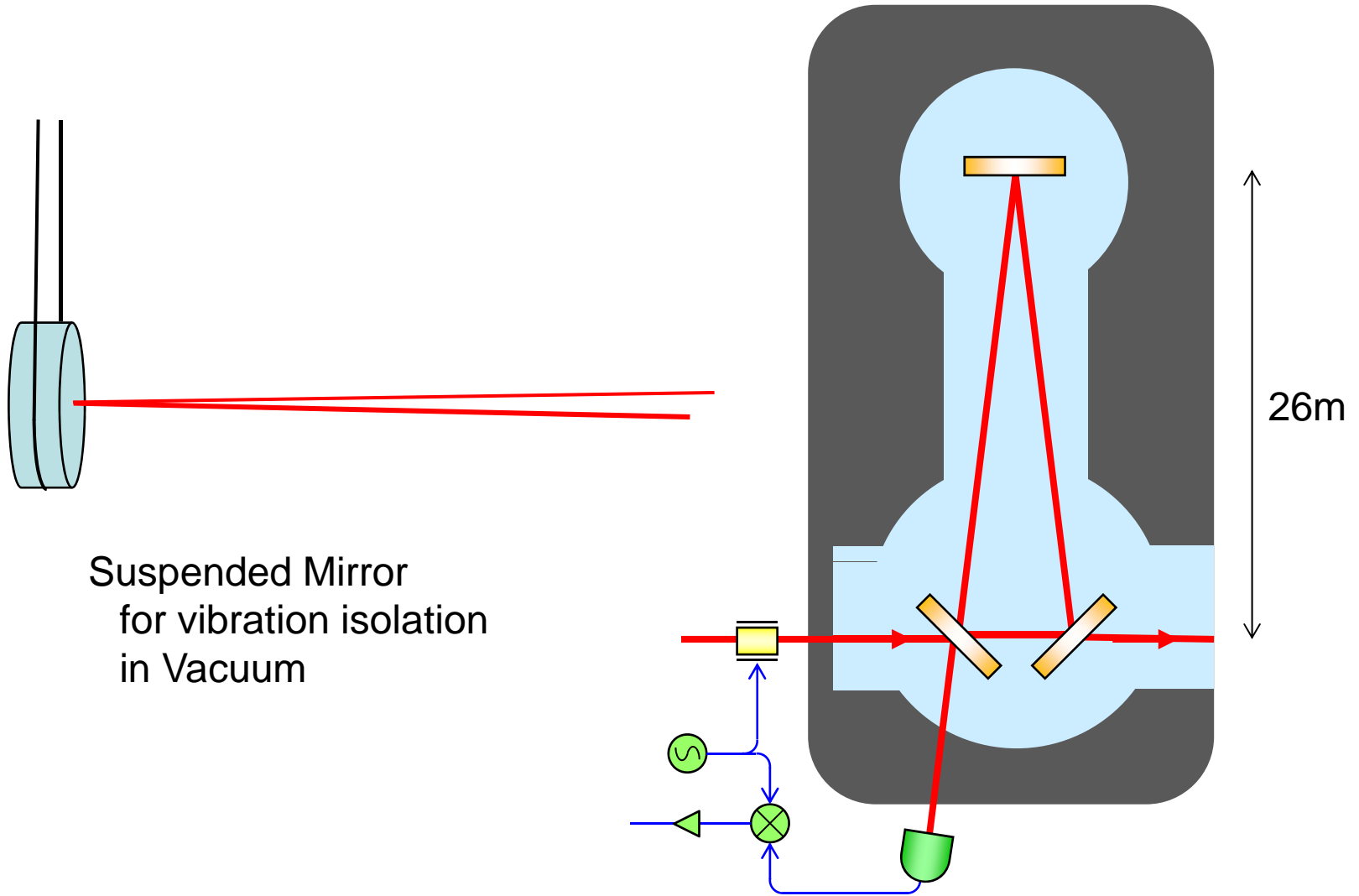


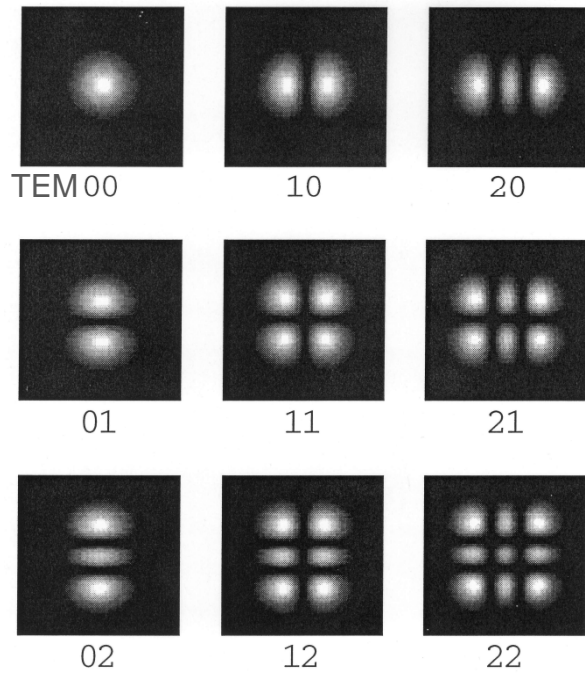




Function
➤ *RF Noise Reduction*

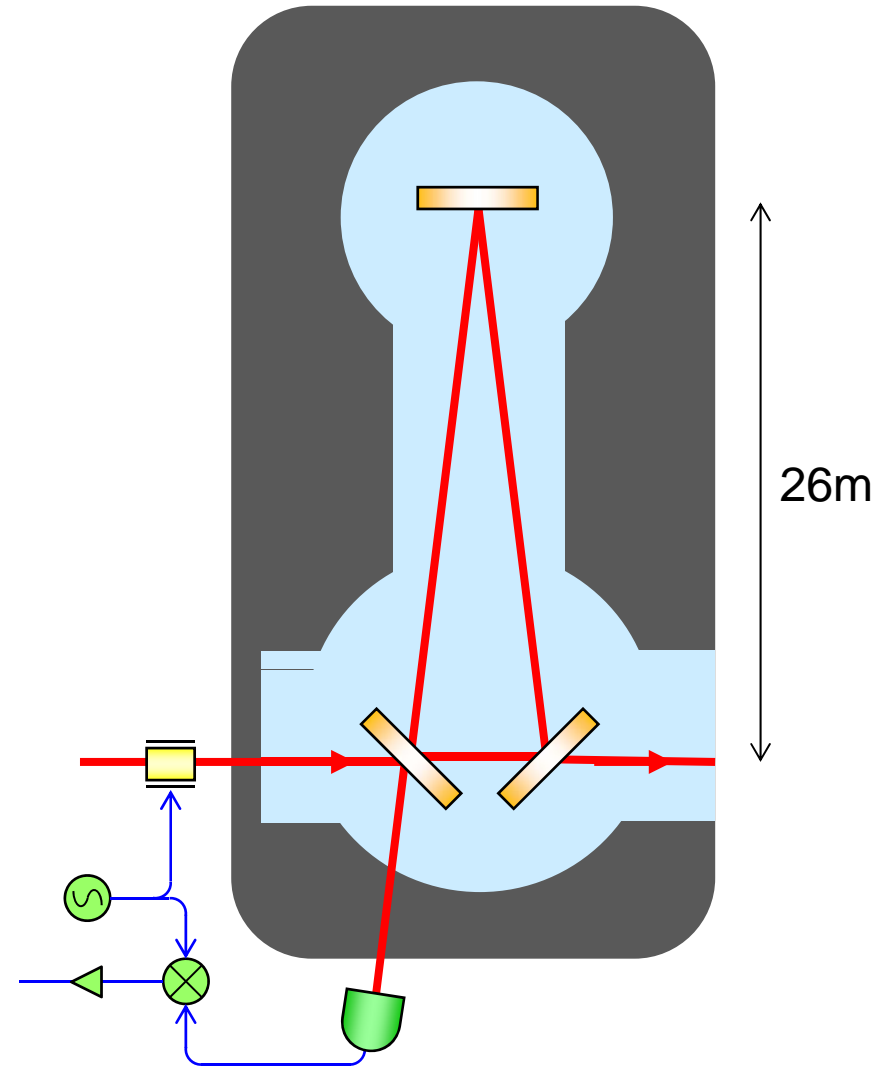


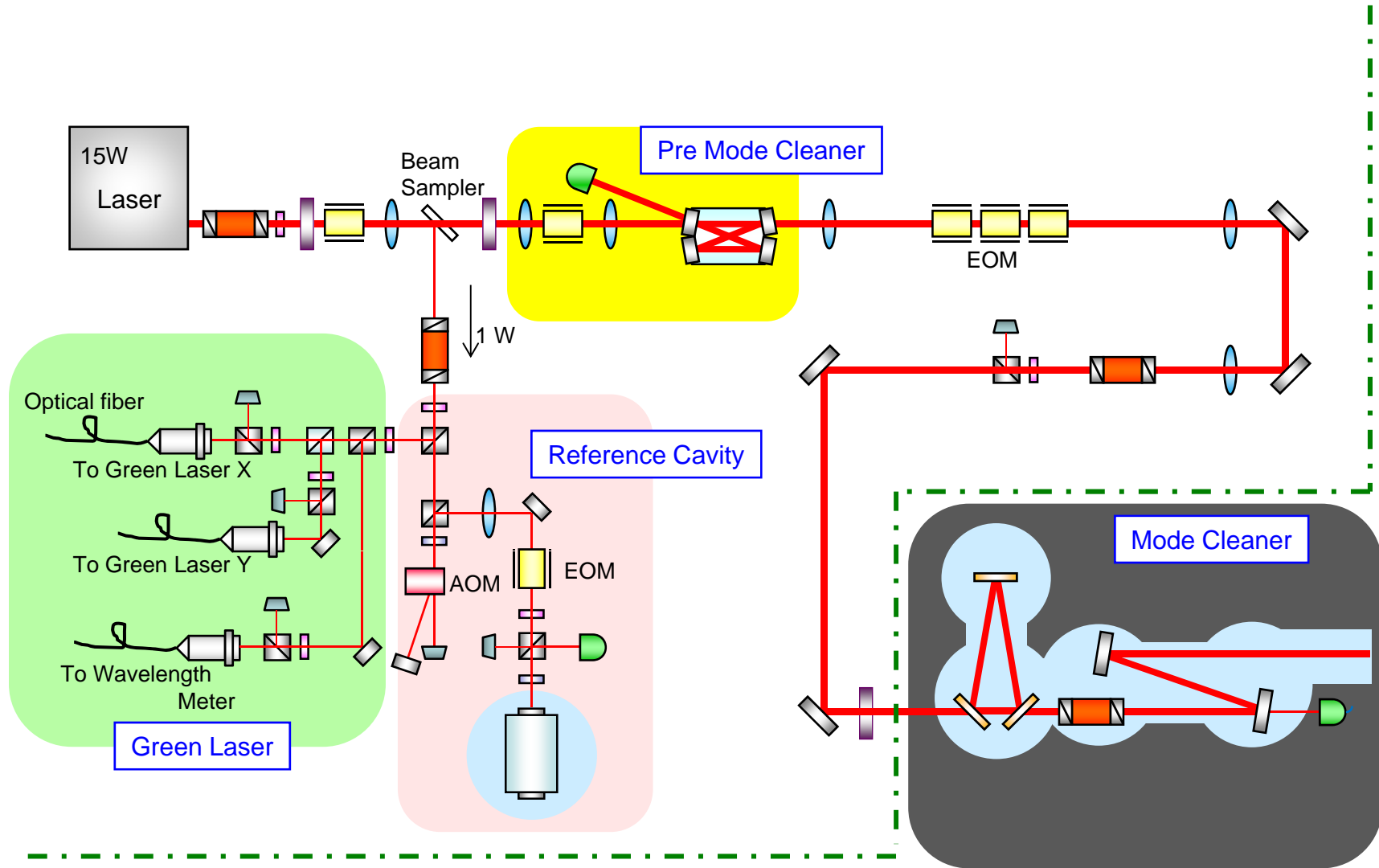


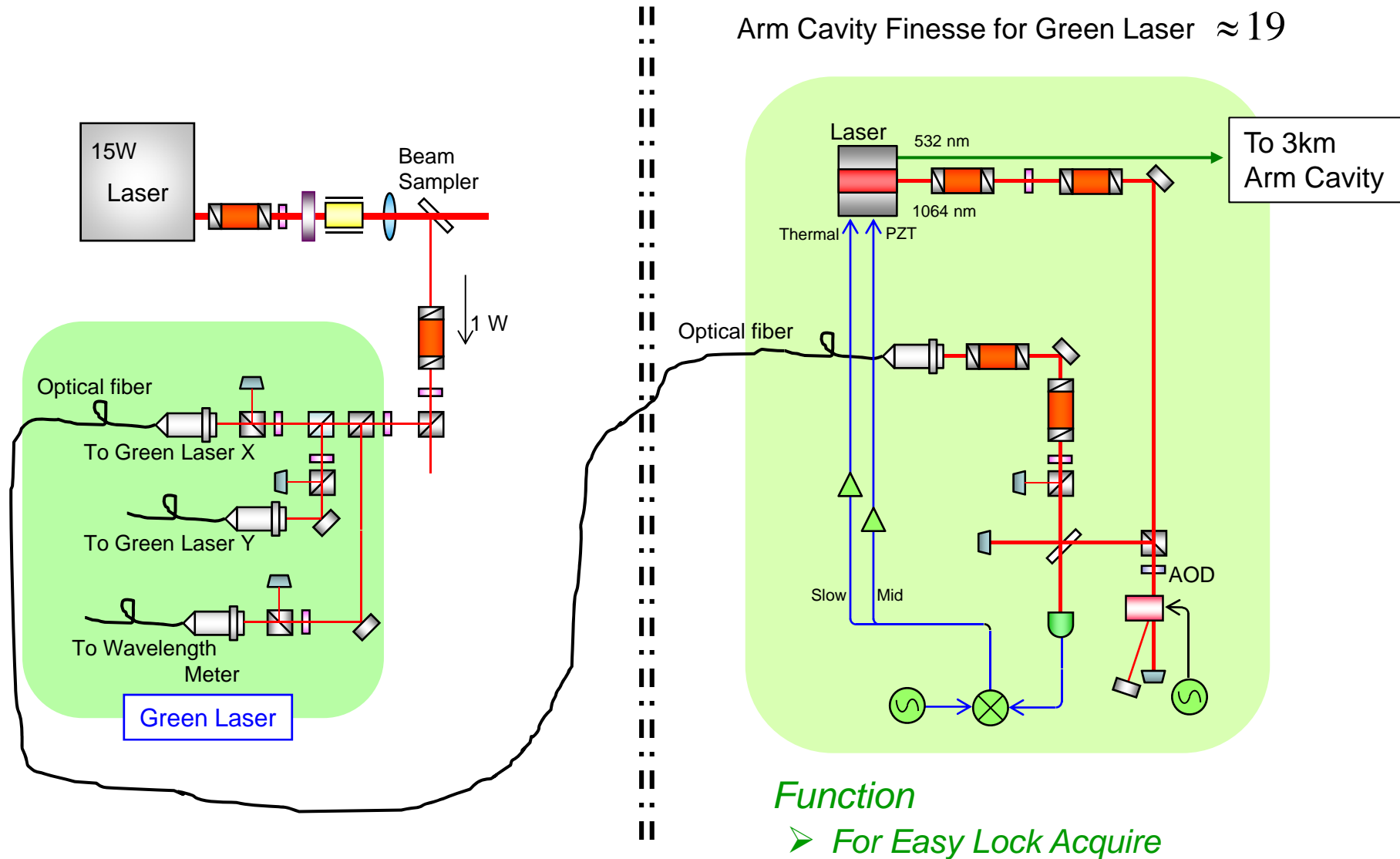


Function

- Spatial Mode Cleaning
- Reducing Beam Jitter
- Laser Frequency Stabilization









まとめ / Summary

System Up

- Reference Cavity
- Pre Mode Cleaner
- Mode Cleaner
- Green Laser

Prepare

- High Power Modulator
- High Power Isolator
- Beam Shutter
- Photo Detector
- etc.