

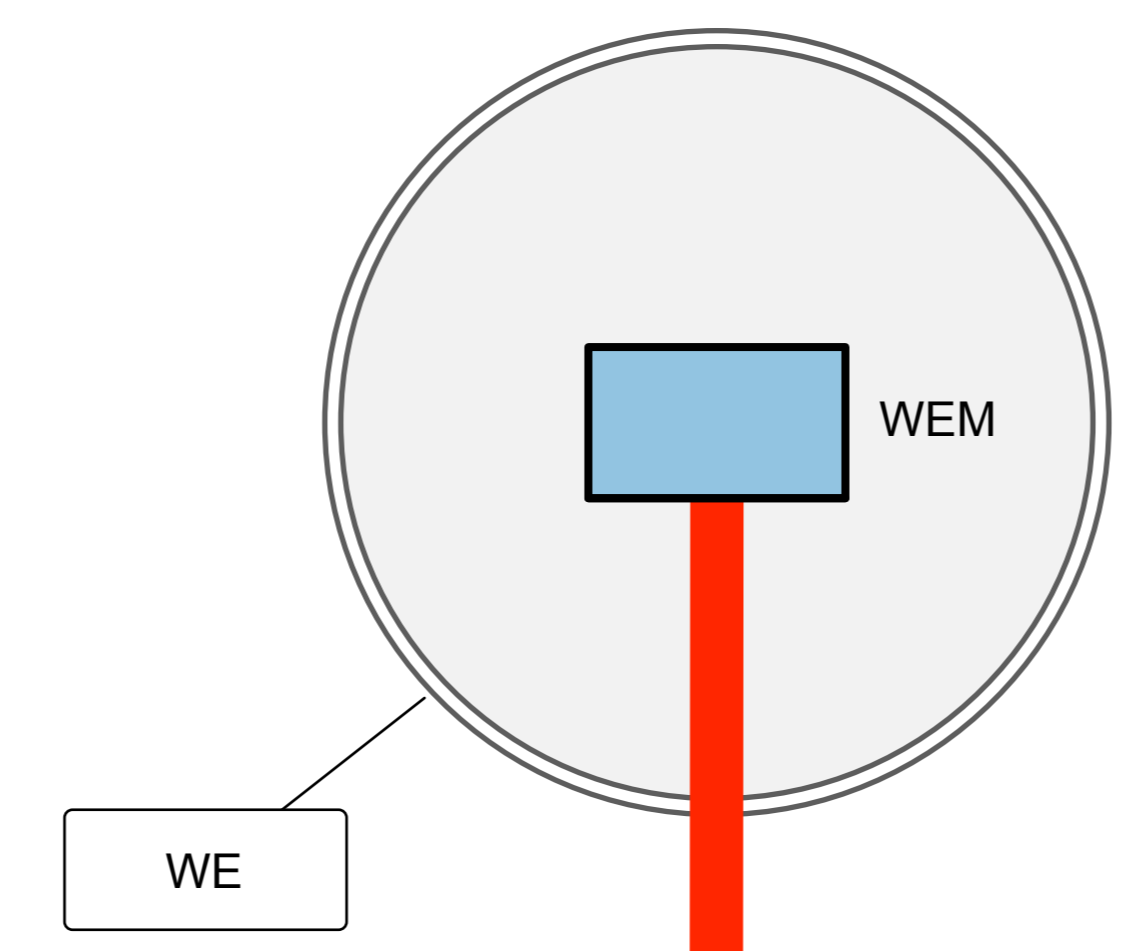
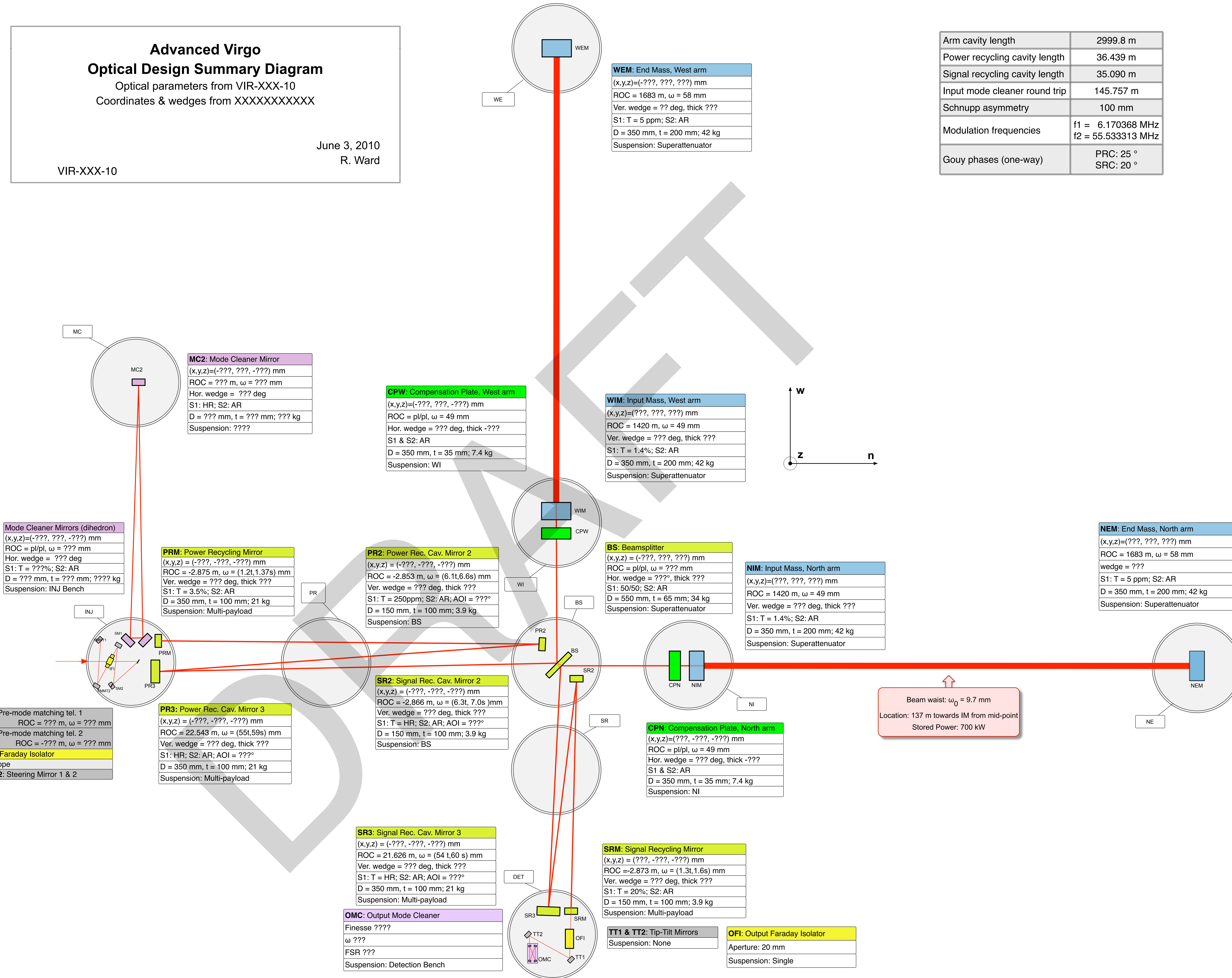
# Advanced Virgo Optical Design Summary Diagram

Optical parameters from VIR-XXX-10  
Coordinates & wedges from XXXXXXXXXXXX

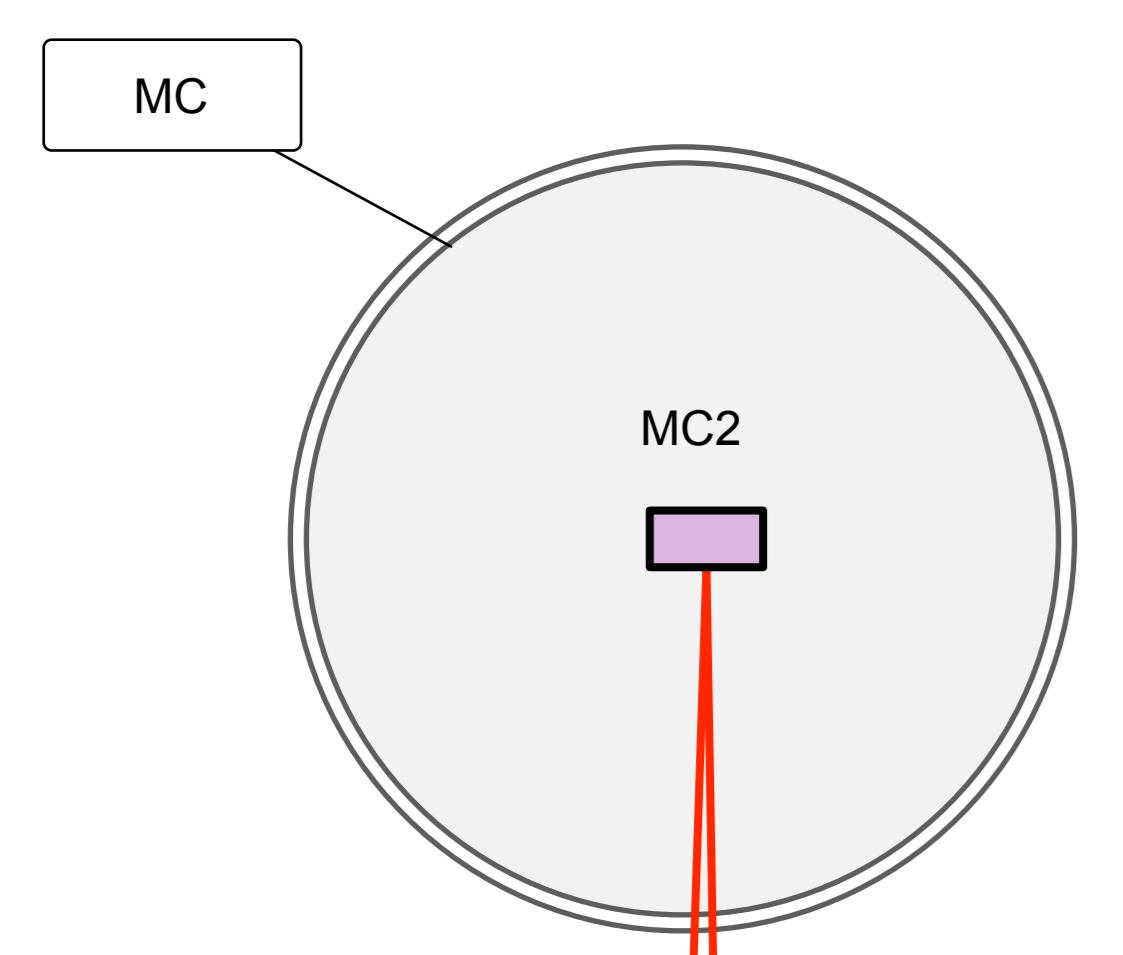
June 3, 2010  
R. Ward

VIR-XXX-10

Arm cavity length	2999.8 m
Power recycling cavity length	36.439 m
Signal recycling cavity length	35.090 m
Input mode cleaner round trip	145.757 m
Schnupp asymmetry	100 mm
Modulation frequencies	f1 = 6.170368 MHz f2 = 55.533313 MHz
Gouy phases (one-way)	PRC: 25 ° SRC: 20 °



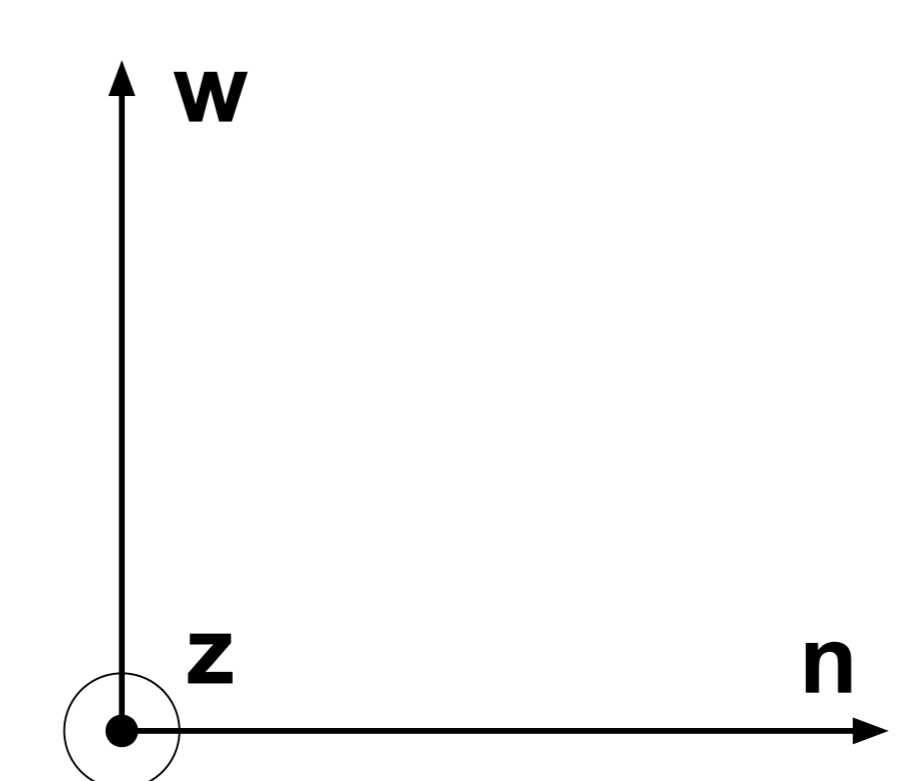
<b>WEM: End Mass, West arm</b>
(x,y,z)=(-???, ???, ???) mm
ROC = 1683 m, $\omega$ = 58 mm
Ver. wedge = ?? deg, thick ???
S1: T = 5 ppm; S2: AR
D = 350 mm, t = 200 mm; 42 kg
Suspension: Superattenuator



<b>MC2: Mode Cleaner Mirror</b>
(x,y,z)=(-???, ???, -???) mm
ROC = ??? m, $\omega$ = ??? mm
Hor. wedge = ??? deg
S1: HR; S2: AR
D = ??? mm, t = ??? mm; ??? kg
Suspension: ????

<b>CPW: Compensation Plate, West arm</b>
(x,y,z)=(-???, ???, -???) mm
ROC = pl/pl, $\omega$ = 49 mm
Hor. wedge = ??? deg, thick -???
S1 & S2: AR
D = 350 mm, t = 35 mm; 7.4 kg
Suspension: WI

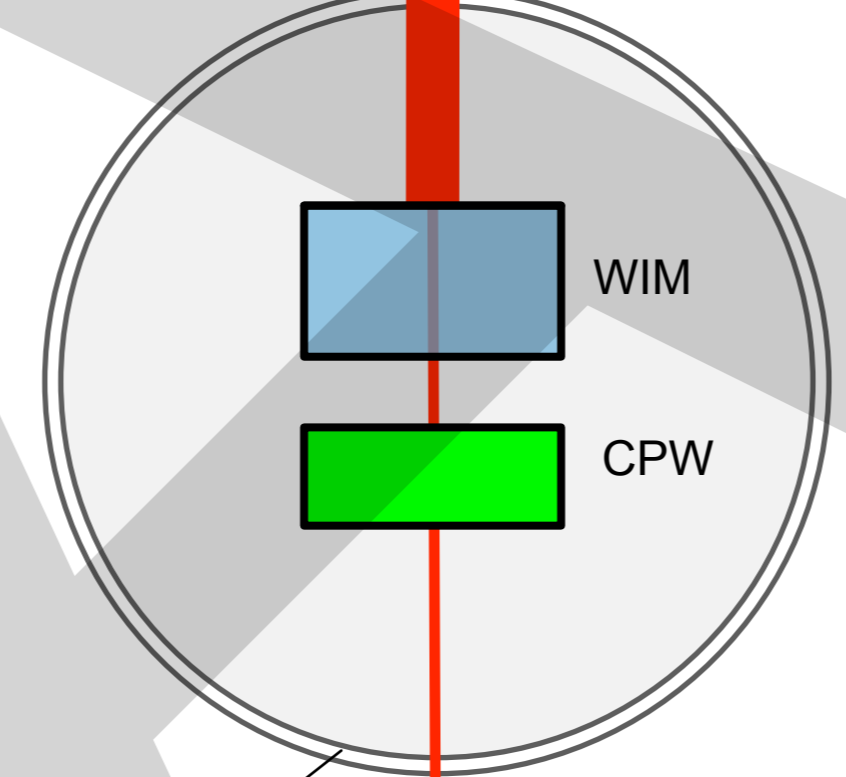
<b>WIM: Input Mass, West arm</b>
(x,y,z)=(???, ???, ???) mm
ROC = 1420 m, $\omega$ = 49 mm
Ver. wedge = ??? deg, thick ???
S1: T = 1.4%; S2: AR
D = 350 mm, t = 200 mm; 42 kg
Suspension: Superattenuator



<b>Mode Cleaner Mirrors (dihedron)</b>
(x,y,z)=(-???, ???, -???) mm
ROC = pl/pl, $\omega$ = ??? mm
Hor. wedge = ??? deg
S1: T = ???%; S2: AR
D = ??? mm, t = ??? mm; ??? kg
Suspension: INJ Bench

<b>PRM: Power Recycling Mirror</b>
(x,y,z) = (-???, -???, -???) mm
ROC = -2.875 m, $\omega$ = (1.2t, 1.37s) mm
Ver. wedge = ??? deg, thick ???
S1: T = 3.5%; S2: AR
D = 350 mm, t = 100 mm; 21 kg
Suspension: Multi-payload

<b>PR2: Power Rec. Cav. Mirror 2</b>
(x,y,z) = (-???, -???, -???) mm
ROC = -2.853 m, $\omega$ = (6.1t, 6.6s) mm
Ver. wedge = ??? deg, thick ???
S1: T = 250ppm; S2: AR; AOI = ???°
D = 150 mm, t = 100 mm; 3.9 kg
Suspension: BS



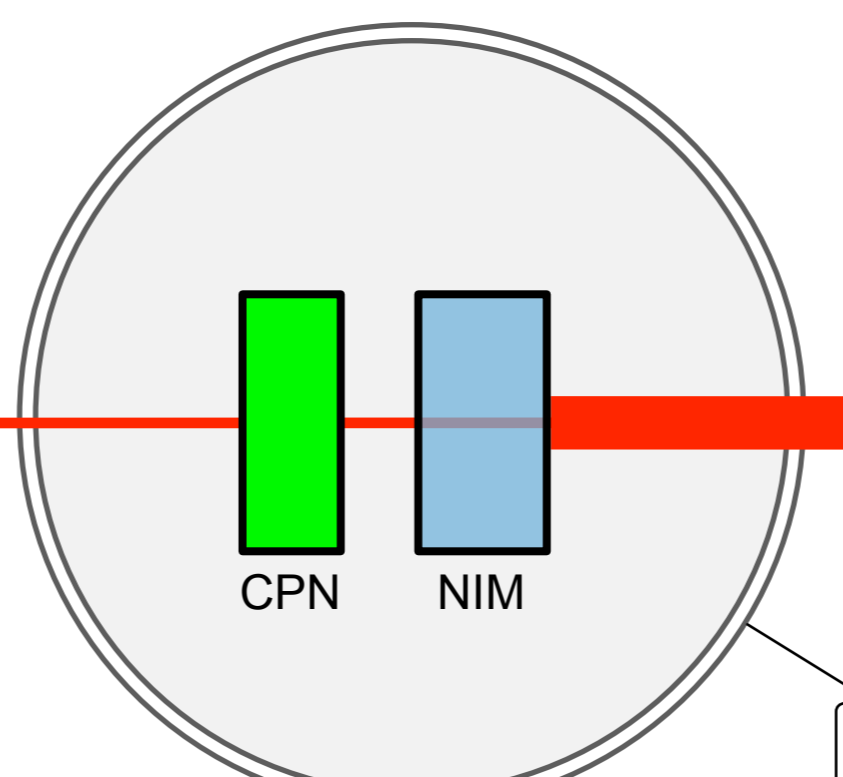
<b>BS: Beamsplitter</b>
(x,y,z) = (-???, ???, ???) mm
ROC = pl/pl, $\omega$ = ??? mm
Hor. wedge = ???°, thick ???
S1: 50/50; S2: AR
D = 550 mm, t = 65 mm; 34 kg
Suspension: Superattenuator

<b>NIM: Input Mass, North arm</b>
(x,y,z)=(???, ???, ???) mm
ROC = 1420 m, $\omega$ = 49 mm
Ver. wedge = ??? deg, thick ???
S1: T = 1.4%; S2: AR
D = 350 mm, t = 200 mm; 42 kg
Suspension: Superattenuator

<b>NEM: End Mass, North arm</b>
(x,y,z)=(???, ???, ???) mm
ROC = 1683 m, $\omega$ = 58 mm
wedge = ???
S1: T = 5 ppm; S2: AR
D = 350 mm, t = 200 mm; 42 kg
Suspension: Superattenuator

Beam waist:  $\omega_0 = 9.7$  mm  
Location: 137 m towards IM from mid-point  
Stored Power: 700 kW

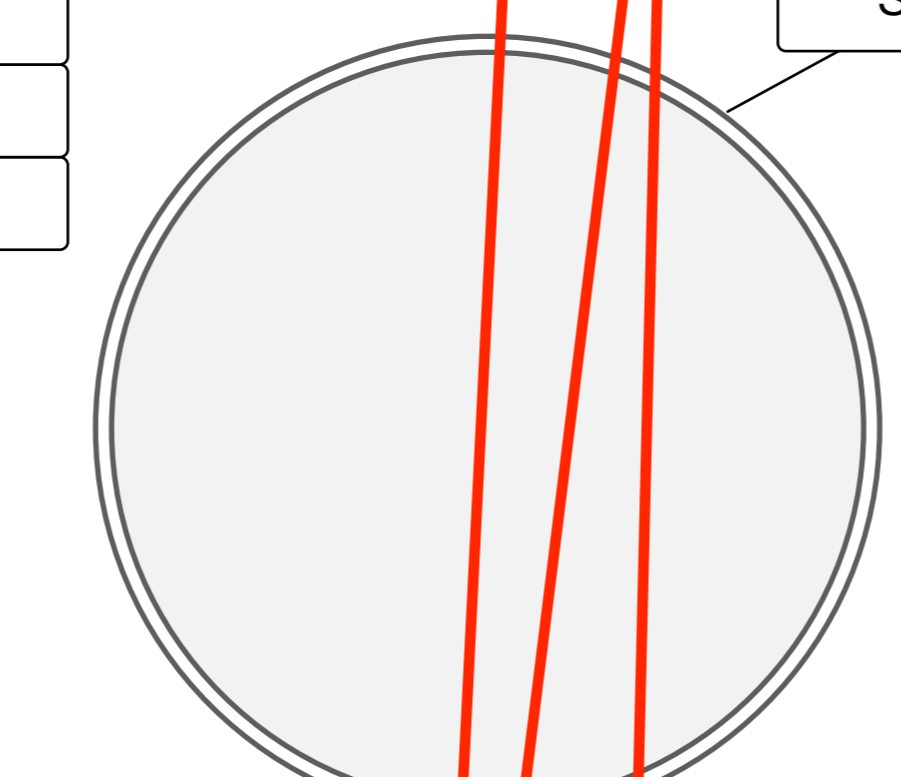
<b>SR2: Signal Rec. Cav. Mirror 2</b>
(x,y,z) = (-???, -???, -???) mm
ROC = -2.866 m, $\omega$ = (6.3t, 7.0s) mm
Ver. wedge = ??? deg, thick ???
S1: T = HR; S2: AR; AOI = ???°
D = 150 mm, t = 100 mm; 3.9 kg
Suspension: BS



<b>CPN: Compensation Plate, North arm</b>
(x,y,z)=(???, -???, -???) mm
ROC = pl/pl, $\omega$ = 49 mm
Hor. wedge = ??? deg, thick -???
S1 & S2: AR
D = 350 mm, t = 35 mm; 7.4 kg
Suspension: NI

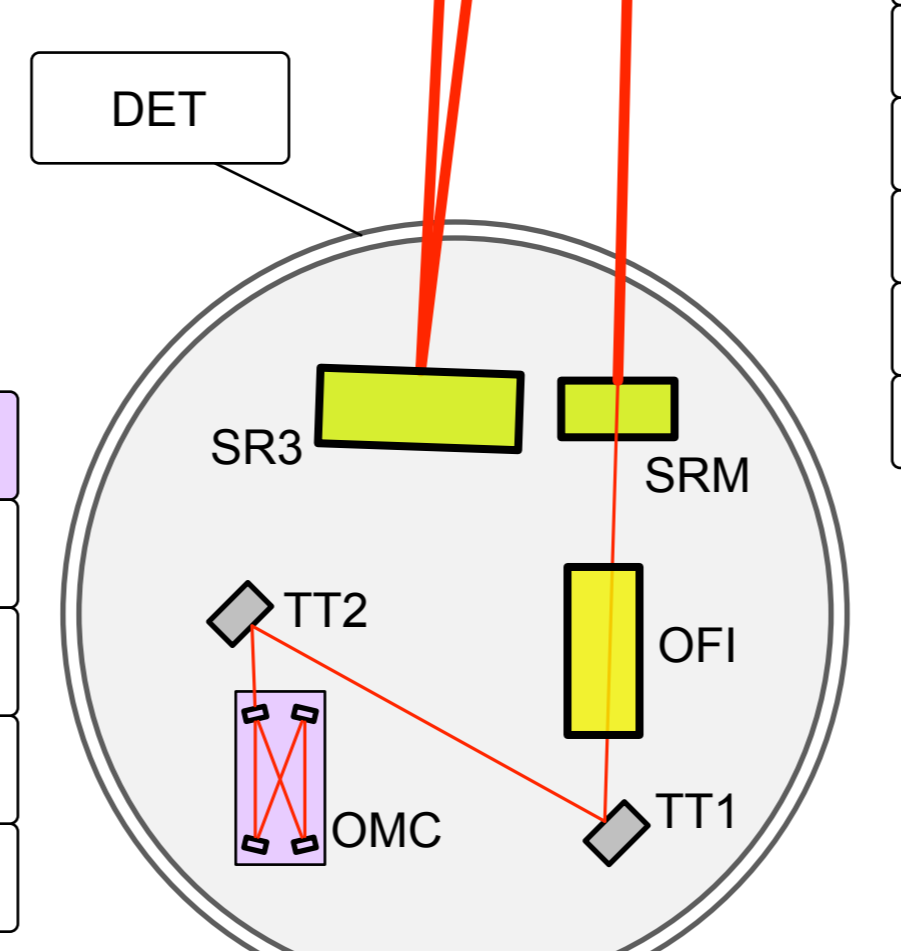
<b>PR3: Power Rec. Cav. Mirror 3</b>
(x,y,z) = (-???, -???, -???) mm
ROC = 22.543 m, $\omega$ = (55t, 59s) mm
Ver. wedge = ??? deg, thick ???
S1: HR; S2: AR; AOI = ???°
D = 350 mm, t = 100 mm; 21 kg
Suspension: Multi-payload

<b>SR3: Signal Rec. Cav. Mirror 3</b>
(x,y,z) = (-???, -???, -???) mm
ROC = 21.626 m, $\omega$ = (54 t, 60 s) mm
Ver. wedge = ??? deg, thick ???
S1: T = HR; S2: AR; AOI = ???°
D = 350 mm, t = 100 mm; 21 kg
Suspension: Multi-payload



<b>SRM: Signal Recycling Mirror</b>
(x,y,z) = (???, -???, -???) mm
ROC = -2.873 m, $\omega$ = (1.3t, 1.6s) mm
Ver. wedge = ??? deg, thick ???
S1: T = 20%; S2: AR
D = 150 mm, t = 100 mm; 3.9 kg
Suspension: Multi-payload

<b>OMC: Output Mode Cleaner</b>
Finesse ????
$\omega$ ???
FSR ???
Suspension: Detection Bench



<b>TT1 &amp; TT2: Tip-Tilt Mirrors</b>
Suspension: None

<b>OFI: Output Faraday Isolator</b>
Aperture: 20 mm
Suspension: Single

<b>PMMT1: Pre-mode matching tel. 1</b>
ROC = ??? m, $\omega$ = ??? mm
<b>PMMT2: Pre-mode matching tel. 2</b>
ROC = -???, $\omega$ = ??? mm
<b>IFI: Input Faraday Isolator</b>
<b>P: Periscope</b>
<b>SM1, SM2: Steering Mirror 1 &amp; 2</b>