

MIF Commissioning Schedule Estimate for bKAGRA Phase 1

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bKAGRA Phase 1 Conditions

- 3-km cryogenic power recycled Michelson
- 2017.3.24 BS suspension complete
- 2017.7.6 PR suspensions complete
- 2017.7.13 Type-A (w/o cryopayload) complete
 - ~2 months of initial alignment period
- 2017.10.2 cryopayload install start
 - IMC WFS 2016.11-12
 - ISS installation 2017.2-10
 - green installation 2017.2-10
- 2017.12.2 ETMY complete
 - 2 months of PR-ETMY commissioning (maybe delayed to 2017 summer-winter)
- 2018.2.2 ETMX complete, 2.19-3.23 cooling down
 - 2 week of PRMI commissioning with cryopayload before cooling down
 - PRMI should be there during cooling
- 2018.3.24?- start cryogenic test run

See, also,

<https://www.dropbox.com/s/jcjin7pladcong3n/VIS%20Overall%20Schedule%2020160617.pdf?dl=0>

Lessons from iKAGRA

- Arm alignment takes ~ 1 week/one-way at most with PSL ~ 220 mW, without PRM ($T = 10\%$) we need more power with PRM installed
- Beam profiling takes ~ 1 day/position
- MICH lock to run takes ~ 3 weeks (including April commissioning period)
- What we didn't do in iKAGRA
 - beam collimating (iteration of PR2/3 position change and beam profiling at ITM/ETM)
 - multi-DOF lock (this time MICH and PRCL)
 - WFS, TRX/TRY, AS port
 - SR2, SR3 alignment
 - FSS using RefCav

bKAGRA Phase 1 Configuration

- 3-km power recycled Michelson
- With REFL/AS for LSC (feedback PRCL to IMC length?)

[W/m]	MICH	PRCL
REFL_I	+9.92e-01	-7.48e+07
REFL_Q	+6.61e+04	-3.52e+07
AS_I	+8.97e+02	-2.23e-01
AS_Q	-1.67e+06	+4.16e+02

- With REFL/AS WFS, TRX/TRY DC QPD for ASC
 - ASC sensing matrix still under study
 - HOM structure also under study
- Maybe with green (not necessary for phase 1)
- No requirement for sensitivity

Commissioning Plan

	2017												2018			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
Type-Bp	PRM+PR2+PR3 (-7/6)															
Type-B	BS (-3/24)															
			SR2 (-8/6)										SR3 (-12/19)			
Type-A	Yend (-3/31)															
	Xend (-7/13)															
CRYp								ETMY (10/2-12/2)								
											ETMX (12/2-2/2)					
											cool down (2/19-3/23)					
Initial Alignment	IMC to PR3 (1w), PR3 to Xend (1w), BS to Yend (1w), collimate beam (3w) spare time for collimation															
						ETMY to REFL (1w), PR-ETMY cavity (1w), BS to AS (1w)							ETMX to REFL (1w)			
Output Tables								TRX (1w), TRY (1w)								
										REFL (1w), AS (1w)						
Locking			PR-ETMY cavity LSC (1w), g-factor measurement (1w), modematching (2w), try ASC (2w)													
							MICH LSC (0.5w), try PRMI LSC before cooling (0.5w)									
											try (PR)MI ASC during cooling (4w)					
Calibration								ETMY calibration before cooling (1d)								
							MICH/PRCL calibration (1d), ETMX calibration before cooling (1d)									
										ETMX/Y calibration during cooling (2d)						
										calibration model, check channels (3w)						

* 1w: 1week, 1d: 1day