

MIF Commissioning Schedule Estimate for bKAGRA Phase 1

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bKAGRA Phase 1 Conditions

- 3-km cryogenic power recycled Michelson
- 2017.3 BS suspension complete
- 2017.7 PR suspensions complete
- 2017.5 Type-A (w/o cryopayload) complete
 - 2 months of initial alignment period
- 2017.10 cryopayload install start
 - IMC WFS 2016.11-12
 - ISS installation 2017.2-10
 - green installation 2017.2-10
- 2017.11 ETMY complete
 - (maybe delayed to 2017 summer-winter)
 - 2 months of PR-ETMY commissioning
- 2018.1 ETMX complete, start cooling down
 - 1 week of PRMI commissioning with cryopayload before cooling down
 - PRMI should be there during cooling
- 2018.3 start cryogenic test run

See, also,

<https://www.dropbox.com/s/jcjin7pladconq3n/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															
Type-B	BS		SR2										SR3			
Type-A	Yend			Xend												
CRYp										ETMY		ETMX		cool down		
Initial Alignment	IMC to PR3 (1w), PR3 to Xend (1w), BS to Yend (1w), collimate beam (3w)									ETMY to REFL (1w), BS to AS (1w)			ETMX to REFL (1w)			
									REFL/TRX/TRY (2w)		AS (1w)					
Locking										PR-ETMY cavity LSC, g-factor measurement, try ASC (6w)						
										MICH LSC (1d), try PRMI LSC before cooling (1d)						
										try (PR)MI ASC during cooling (8w)						
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

Appendices

300 K PRMI Schedule Estimate

- IMC to PR3 initial alignment: 1 week
- PR3 to ETMX initial alignment (with PRM misaligned): 1 week
ETMX dummy payload should be ready by mid-June at least
- ETMX to REFL initial alignment: 1 week
- BS to ETMY initial alignment: 1 week
ETMY dummy payload should be ready by the end of June at least
- ETMY to REFL initial alignment: 1 week
- BS to AS initial alignment: 1 week
- beam collimation with PR2/3: 2 weeks
- PRM initial alignment: 1 week
- REFL, AS, TRX, TRY optical table setup: 2 weeks (done in parallel)

- PRMI LSC: 1 week
- PRMI ASC: 3 weeks
- PRMI calibration, channel check, etc: 3 weeks
- Test run with 300 K dummy payload: 1 week

2 months for
initial alignment

2 months for
commissioning
and test run

CRYp PRMI Schedule Estimate

- ETMX and ETMY initial alignment: 0.5 week
- PRMI restoration: 0.5 week
→ start cooling down

1 week for
CRYp PRMI