MIF Commissioning Schedule Estimate for bKAGRA Phase 1

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bKAGRA Phase 1 Conditions

- 3-km cryogenic power recycled Michelson
- 2017.1 BS suspension complete
- 2017.5 PR suspensions complete
- 2017.5 Type-A + dummy payload ETMs complete
  - 4 months of (PR)MI commissioning with dummy room temp. mirror

Green could be ready at this point.

- 2017.10 cryopayload install start
- 2018.1 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

Lessons from iKAGRA

- Arm alignment takes ~ 1 week/one-way at most
  with PSL ~ 220 mW, without PRM (T = 10 %)
- 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
- Maybe with green (not necessary for phase 1)
- No requirement for sensitivity

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)

2 months for initial alignment

- 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 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

Summary

- All of the PRMI commissioning except CRYp initial alignment has to be finished with 300 K dummy payload (2017.6-9)
- 4 months should be enough for us (but with no margin)

- Items which should be ready by 2017.5
  - all the analog electronics
  - LSC/ASC RT model, including calibration
  - LSC/ASC modeling (e.g. Optickle)
  - cabling diagram