

MIF Schedule Estimate for bKAGRA Phase 2

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Installation Schedule

- 2017.9 BS and PRs ready
- 2017.11 ETMs ready
- By 2018.3 bKAGRA Phase 1 complete
- 2018.8 SRs ready
- 2018.7 Green ready
- 2018.8 ITMX ready (Y first?)
- 2018.11 ITMY ready

bKAGRA Phase 2 Goal

- Achieve full lock of the main interferometer
- No sensitivity goal
- Open questions:
 - laser power?
 - prototype OMC? DC or RF readout?
 - no detuning?
 - moderate reflectivity SRM?
 - vacuum?
 - ETM swap?
 - ETM swap comes after Phase 2. Swap takes 2.5 month. If quality is too bad for RSE, we will swap during Phase 2.
- When to cool down the mirror? ITM cooling test? Cooling down takes ~1 month, warm up takes ~< 1 month.

Steps for Full lock

- X-arm (IR and green)
GreenX, TMSX, PR mirrors, REFL optics
- Y-arm (IR and green)
GreenY, TMSY, SR mirrors, REFL optics
- FPMI (IR and green)
X-arm, Y-arm, AS optics
- DRMI
f3 modulation, POP optics
- Full locking
(prototype) OMC
- Cool down ITM/ETMs
- DRSE (optional for Phase 2)
frequency stabilization?
- Things necessary are written below each step

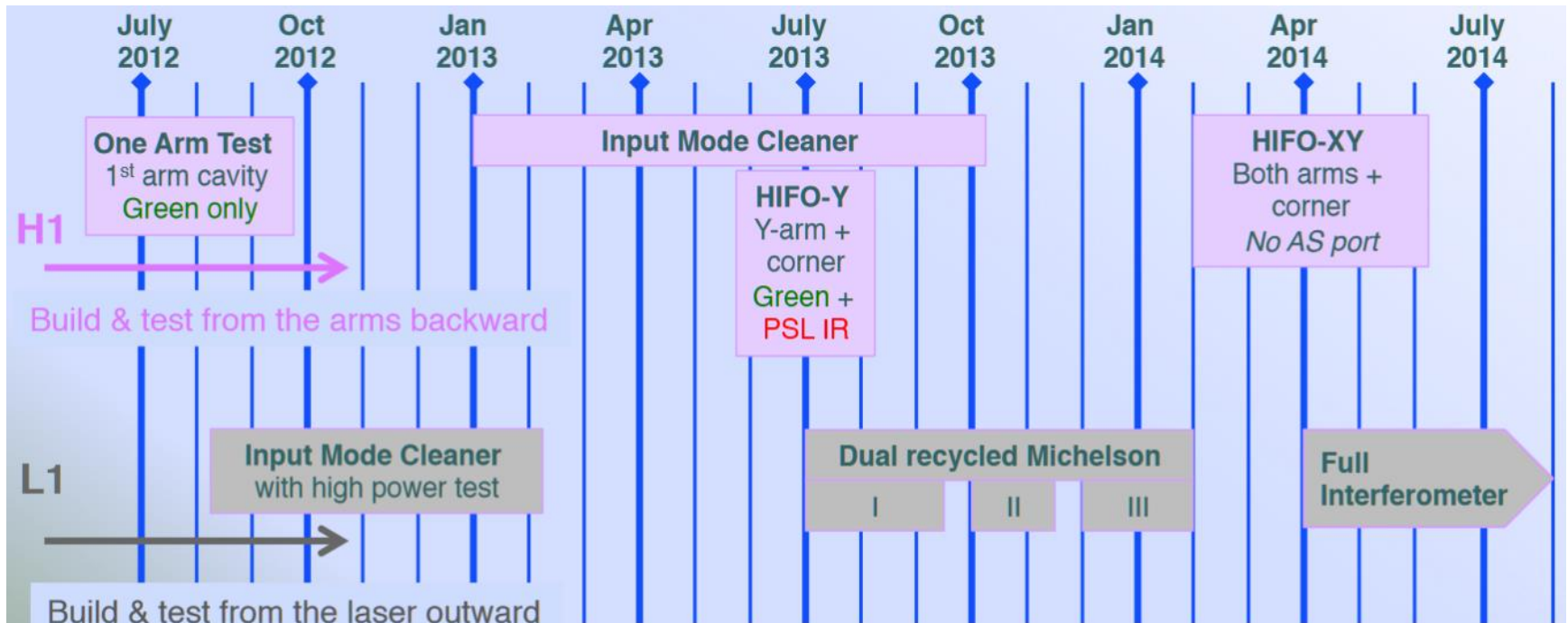
aLIGO Experience

- X-arm (2 months at LHO)
- Y-arm (2 months at LHO)
- FPMI (2 months at LHO)
- DRMI (7 months at LLO, 1.5 months at LHO)
- Full locking (1.5 months + 1.5 months for OMC readout)

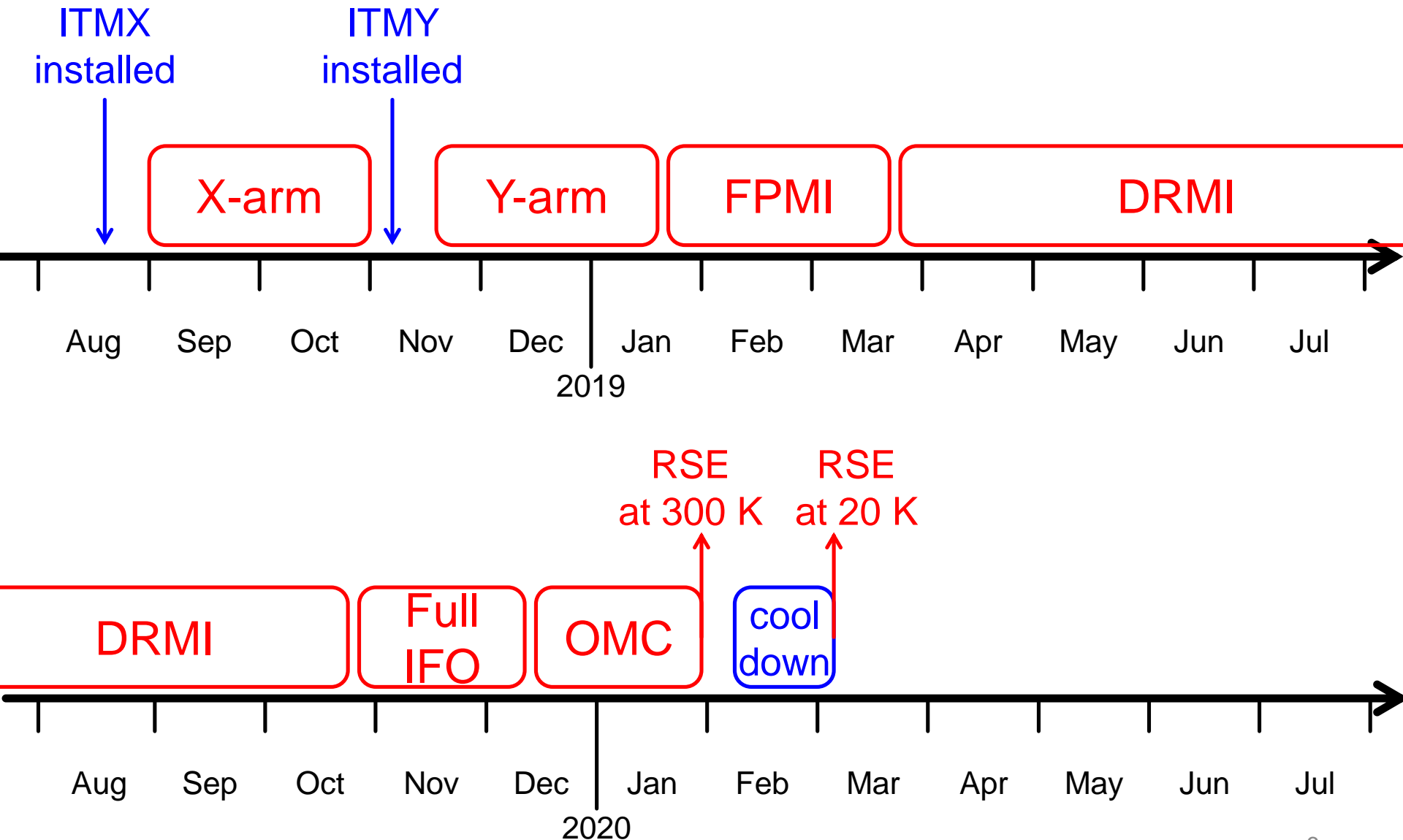
M. Laundry, [LIGO-G1300759](#)

K. Izumi, [LIGO-G1400529](#)

P. Fritschel, [LIGO-G1401078](#)



Estimated Timeline



General To Do List before Phase 2

- RF PD/QPD characterization
- DC QPD holder
- Detection table optics design
- Electronics and cabling
- RT model, MEDM screens, guardian scripts
- LSC/ASC modeling for ALS and intermediate steps
- NoiseBudget
- RF generation scheme, RF AM generation scheme
- AS optics design (OMC, OFI, OMMT)
- Initial alignment planning
- In-vacuum optics/electronics design