

MIF Report for the bKAGRA Phase 2,3 Evaluation Meeting 2021

Yuta Michimura

Department of Physics, University of Tokyo

Scope of this report

- Here, we discuss MIF activities after bKAGRA Phase 1, until the first observing run (2018.5-2020.2)
- Focus on
 - procurement and installation activities
 - calculation and simulation activities
- Commissioning activities at the site will be reported by commissioning team

Legend:

(almost) done



Half done



Designing



Thinking



Procurement & Installation Tasks

- RF cables and circuits 😊 (Upgrade of VCO for RefCav?)
- ALS scheme 😊 (Upgrade of fiber noise cancellation?)
- Optical layout of optical tables 😊
- Optical table covers 😐 (TRX and TRY on going)
- High power upgrade of REFL port 😞 (beam dumps)
- In-vac RF PD and RF QPD 😞
- DC QPD 😞 (do we keep using oplev QPDs?)
- In-vac steering mirrors [with IOO/AOS] 😞 (p-pol around IFI and OFI, beam dumps; around IFI on-going, around OFI not yet)
- Beam shutter and OMC upgrade [with IOO] 😞 😐 (installed but not sufficient)
- Safety guard around output optics [with IOO] 😊 (screw heads need to be made black)
- Upgrade of Mach-Zehnder modulator [with IOO] 😞 😐 (installed but not sufficient)

Calculation & Simulation Tasks

- Initial alignment scheme 😊
- Coil drivers for cryopayload 😊 (switch necessary for O4)
- SRM transmission for O3 and O4 😊
- IFO configuration, sensitivity calculations for O3 and O4 😊
- ITM inhomogeneity, birefringence, asymmetry 😞 (further study necessary to evaluate the effects of birefringence)
- LSC modeling 😞
- ASC modeling 😞
- ALS modeling 😊

Other Notes

- Work division and collaboration between the Commissioning Team didn't work well
- Unclear scope:
 - MIF Subgroup (Chief: Michimura)
 - Commissioning Team (Leader: SEO Miyakawa)
 - RSE Task Force (Leader: Nakano / SEO Ando)

Evaluation Summary

- Minimum calculations and items necessary for the RSE lock was prepared successfully for O3.
- How to proceed with in-vac items is not yet fixed. Manpower not allocated.
- Simulation activities are quite active than ever with new people. Hope to continue the activity.