Alignment works

- Current status as of 1/22: IR and Green reached X end PD.
- ~~1/22: Surface inspection for PR mirrors.~~
- ~~1/23: Surface inspection for SR mirrors.~~
- ~~1/24-25: Cleaning HR of SR3, SRM.~~
- ~~1/23: BS is aligned to Y-end PD by IR.~~
- ~~1/27: ITMY is aligned to REFL by IR.~~
- ~~1/27: ITMX is aligned to REFL by IR.~~
- ~~1/27: Beam position of IR at SR3 is confirmed how far from the center.~~
- ~~1/28-29: SR3 is aligned to SR2 center by IR.~~
- ~~1/28: Alignment of SR2 -> SRM by IR.~~
- ~~1/29: Green beam is injected from SR2 AR surface to Y end PD.~~
- ~~1/31: Removing bellows at PR and SR area.~~
- ~~1/31-2/1: Cleaning HR of PR3 and HR, AR of SR2~~
- ~~2/5: Alignment of SRM to OMMT1 by IR~~
- ~~2/6: Alignment of ETMY to POS by Green~~
- ~~2/8: Alignment of form OMMT to OSTM by IR~~
- ~~2/8: Alignment of form OSTM to OMC by IR~~
- ~~2/14: Closing door for ITM chambers~~
- ~~2/15: pumping down for ITMs~~
- ~~2/15: Closing door and pumping down for other central area~~

- All done within the due date!

Issues and current

- Small leakages were found at SR chambers
  - > We leave them this time.
- Some large leakages were found at both ITMX and ITMY this afternoon.
  - Shall we open the chambers?
- Mirrors for test mass seem to be dirty
  - > We leave them this time.
- Some works for VIS remaining;
  - Needs damping controls for BS and SRMs.
  - ITMX seems to be OK, but ITMY has to be checked.
- Coupling to other DOFs on position sensors at payload.
- 2/17: Beam reached to both X and Y ends again.

Next tasks

- 3/11~ : Night work start
- 2/18-3/22 DRMI commissioning: started!
  - Two ITMs will be cooled down in DRMI comm.?
- 3/11-4/5 Y arm commissioning
- 3/25-4/5 FPMI commissioning
  - engineering run?
  - Two ITMs will be cooled down after FPMI comm.?

DRMI commissioning

Task definitions summarized at JGW-T1909573.

(1) to demonstrate that a resonance of the DRMI can be robustly acquired by using the digital feedback control system.

(2) to demonstrate that we can reproduce almost the same interferometer alignment which is sufficient to proceed with the subsequent full lock sequence.

DRMI commissioning

- Keeping all three length degrees of freedom in the DRMI locked for a duration longer than 30 minutes continuously, with the third harmonic demodulation.
- The DRMI acquires lock within a waiting time of 10 minutes.
- DRMI with a global alignment control system engaged using the wave front sensors for a duration of longer than 2 hours continuously.
- Full automation.
- calibrated- and unsuppressed- displacement monitor channels for all three length DOFs calibrated- and unsuppressed- displacement monitor.

Parameters in DRMI

- Power recycling gains for the f1 and f2 sidebands with and without the signal recycling cavity.
- Sensing matrix for the length/angular signals.
- The macroscopic length of the power/signal recycling cavity.
- The size of the Schnupp asymmetry.
- The cavity round trip Gouy phase of the power/signal recycling cavity.
- The power/signal recycling gain for the carrier field.