Argos installation campaign II

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Dear Argos Team and Friends,

another round of installation work for ARGOS at the LBT just has come to an end. In this 1 week comparably short campaign we have been attacking several tasks on the laser system left over from last time and continued to bring the beams closer to sky.
First of all many thanks to the great team doing so excellent work in a good mood. The team on duty this time: Matthias, Julian, Walfried, Hans, Jose, Martin & Wolfgang- really great work. Many thanks as well to the excellent support from LBTO- Gustavo and Michael and the whole telescope team! A pleasure to work with you all.

Now, what has been done this time:
- we have mounted new tools o the laser system that makes the access to, and the handling of the heads easier, such that they can be slided in and out without risk of damge. While we had all lasers out of the system we additionally mounted the new solid state flexure stages that now hold the beam pre-expanders to the lasers. With this tool it is now extremely easy to align the expanders to the lasers, again facilitate a head exchange.
-continuing from the last campaign we started then to align the launch system to the lasers, using the central alignment laser and newly produced targets on LAL. We found that on DX the direction of the beam still was ok from last time and could be refined. On SX the laser box needed slight tilting to hit the center of the lens. With this setup we varified the flexure when tilting the telescope from zenith to horizon. Here we do see around 2 arcmin on the beam with the main flexure being present from the launch input lens flexing in its focus stage. Since the magnification of the launch lens should de-magnify this angle by a factor 50, we hould be ok here.
in the following the launch lenses where aligned with tilting them and observing the back reflection on the laser system. After learning how the LAL mounting screw system works, we could tilt the reflection of the beam nicely in itself. Nevertheless the screws are difficult to handle and leave quite some stress on the mounting points due to the unequal tilt.
Measuring the launch telescopes focus positions on the back reflection showed that the large lenses are off in focus and need to be pushed out by ~20mm on both sides. Since this amount of travel is by far not available from the LAL mounting screws, we had to stop here and will come back next time with new mounting points.
Looking further in the alignment of the large fold mirrors we found that the tilt direction of LM1 seems to be perfect on SX- nicely done Mat & Jamison et al.! On DX this action could not be performed since the secondary and accordingly the LM2 are currently not there of course...we ontinued with the alignment of LM2 on SX, checking first the reflection our alignment laser on the ceiling, and the back reflection from the small alignment pism towards LM1. With probing the M1 mirror edge distance to the green spot on the ceiling we could verify that the beam should be within 2 arcmin on axis- nicely done again. On the other hand the prism back reflection seems to be far off- 1.5m from the LM1. This piece seems to be mis-placed, or built in flipped
In parallel to the alignment work a lot of other action have been taken with system test, electronics and Software and even LUCI: (in short listed here, but quite a lot of work!)
-LUCI has been opened and the robot was removed and packed for refurbishment in Garching.

-The telescope emergency stop sensing was connected to the ARGOS main interlock system.
-The C-ring racks have seen the final cabling and have been powered and tested.
-The launch SW controller has been setup
-The satellite avoidance SW has been implemented is now ready for testing with the US officials.
-Laser system SW and SW upgrades have been tested and used for powering up and running the lasers.
-With powering up the laser the underperforming laser head #6 was exchanged with the spare #7 with finding that the spare was exactly doing the same, producing only half power. With additionally swapping two heads, we verified (with some confusion inbetween...) that only the two heads are underperforming and the power supplies are ok. Since we not yet have the test stand ready at the LBT, we now packed the two heads and will ship them to Germany for inspection and refurbishment if required.
At the end of the campaign we finally could do a test of the LM2 clamp shell remote operation and a test of the LM1 (SX) remote tilting. Finally the DX launch lens was covered with a new protection & alignment cover and the LM1 mirror covers where taped to avoid that dust continues to penetrate the gaps.

to be continued,
all the best
Sebastian

attached some- fully non representative- images
-Michael inspecting alignment target
-Julian in the windbracing
-Wolfgang with hardware
-alignment laser on the LM2 clamp shell
-Alignment laser pattern on the large lens target
-the Coati, twice seen by the commuting team- and of coarse turning until the photo is ready..

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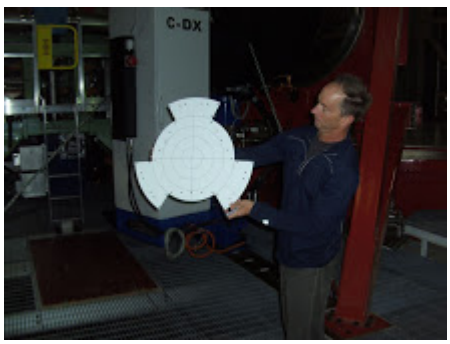

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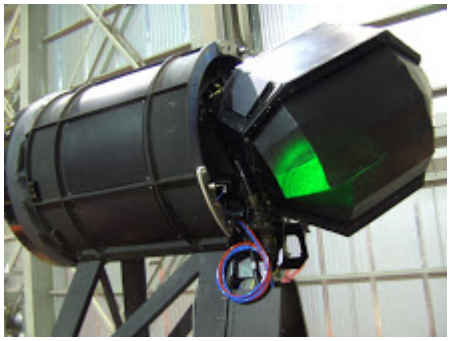

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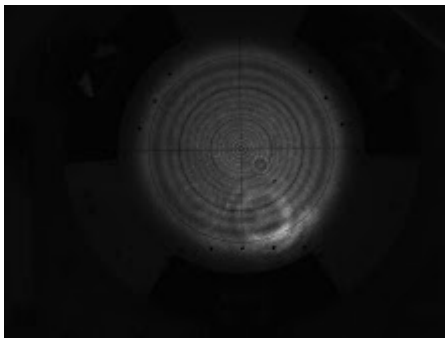

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