

2019-10-12 VEGA observation

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Start at UT1:30

V52, Nardetto E2P2B1 – W2P5B2 – W1P3B3 (offset +150, -300)

UT01:45: AO star HD189319. Alignment of W2W1 on the LABAO, E2 on LABAO and TELAO. $r_0=8\text{cm}$.

UT02:10: check star HD184606 for fringes but W2 cart refuses to track! So we go to W2 as REF finally. $r_0=8\text{cm}$. W1=-1000, E2=-1200. BC1=7.65, BC2=4.80.

UT03h15: cal1 **HD187811.2019.10.12.03.15** $r_0=8-10\text{cm}$. Nice tracking on CLIMB. Very rapidly two peaks on VEGA. Third peak seen. $r_0=9/10\text{cm}$.

UT03:25: target **HD187921.2019.10.12.03.27**. E2=-1230 W1=-1230. $r_0=9\text{cm}$. Very good tracking by CLIMB. Not convincing fringes on VEGA. 160 photons on average. r_0 around 11cm. Even the W1W2 fringes are not clearly seen.

UT03:41: cal2 **HD185859.2019.10.12.03.49**. E2=-910, W1=-880. $r_0=11\text{cm}$. Fringes ok on CLIMB but not completely excellent. Fringes ok on VEGA. ~200photons. 3 fringes ok on VEGA. E2 pupil is looking like the central black hole of the Milky Way... Even the flat does not improve the situation

UT03:58. We start by adjusting the flat on E2 on HD189319. W1&W2 pupils are really nice. E2 pupil is better now but still with a small hole. Probably a problem of reconstructor on E2 pupil. Target **HD187921.2019.10.12.04.13**. CLIMB signal is very strong but the tracking does not very good. Probably the setting of NIRO is saturating. VEGA fringes ok on W1W2, weak on E2W2, not convincing.

UT04:22: cal1 but we need to readjust the reference position from 44m to 42m. **HD187811.2019.10.12.04.30** $r_0=12\text{cm}$. Nice fringes on CLIMB? Really good tracking. Nice fringes on VEGA. This cal is brighter (600 photons) and the signal is stronger. 3 peaks well identified on VEGA. $r_0=13\text{cm}$.

UT04:40: We change the POPs to have observability up to UT7:00, E2P1 and W1P4 and we redo the flat afterwards. CLIMB is saturated and fringes are not well tracked. Olli changes the setting. Target **HD187921.2019.10.12.04.58**. E2=-170, W1=-600 after the POP changes. $r_0=13\text{cm}$. Good tracking with CLIMB now. At least W1W2 ok on VEGA. Breakfast time!

UT05:07: cal2 now **HD185859.2019.10.12.05.11**. Nice tracking and very nice fringes rapidly seen on VEGA. $r_0=13\text{cm}$

UT05h20: target **HD187921.2019.10.12.05.23**. Nice tracking. Fringes on VEGA are really faint. $r_0=13\text{cm}$. W1W2 ok, E2W2 after 15 blocks ok.

UT05h32: cal1 **HD187811.2019.10.12.05.34** $r_0=13\text{cm}$. Immediate fringes on VEGA (all 3); nice tracking by CLIMB

UT05h43: target again. **HD187921.2019.10.12.05.44**. Very nice tracking by CLIMB. Same situation as previously on VEGA, weak W1W2 after a few blocks.

UT05:53: cal2 now **HD185859.2019.10.12.05.57**. $r_0=13\text{cm}$; good tracking by CLIMB and nice fringes rapidly seen on VEGA. 3 nice peaks on VEGA.

UT06:04: target now. [HD187921.2019.10.12.06.08](#). $r_0=13\text{cm}$; good tracking on CLIMB. Fringes on VEGA seem a little bit better as expected due to the reduced projected baselines. Well at least on W1W2 and E2W2.

UT06:17: cal1. [HD187811.2019.10.12.06.19](#) the good seeing conditions are continuing. Immediate fringes on VEGA (E2W2 and W2W1). Good tracking on CLIMB but NIRO should have been probably realigned. 3 nice peaks on VEGA.

UT06:28: target with new alignment of NIRO. [HD187921.2019.10.12.06.33](#). Tracking ok on CLIMB (but the target is bright in K). Fringes ok on VEGA. W1 LDC is at its upper limit so the cophasing on this one (W1W2) is slowly moving now: Error is now $+30\mu\text{m}$. Good conditions although we are quite low now and the apparent seeing values are degrading.

UT06:42: cal1 to conclude this program. [HD187811.2019.10.12.06.47](#). Nice tracking.

C1-T1-C2-T2-C1-T3-C2-T4-C1-T5-C2-T6-C1-T7-C1

UT06:56: Spectral calibration [D_CM720.2019.10.12.07.01](#)

V01, Ligi S1P1B2-W1P4B3, offset=+150

UT07:10: AO star HD196867 for S1. Alignment of NIRO and VEGA. Fringes at -1000.

UT07:17. Cal1 [HD210129.2019.10.12.07.23](#) $S_1=-1600$. $BC_2=4.26$. r_0 12-15cm. Tracking CLIMB quite ok, 1/4 -1/5 of the waterfall width. Nice peak on VEGA. The quality of tracking on CLIMB is slightly improving. $r_0=16\text{cm}$!

UT07h32: target [HD209458.2019.10.12.07.46](#). Fringes seen at -1750 but communication issues with OPLE and finally OPLE crash. $S_1=-1438$. Very good tracking on CLIMB. Less than 100 photons. Fringes VEGA almost invisible, maybe a very small signal after 20 blocks. Excellent fringes on CLIMB however, so let's see for the post-processing. VEGA tracker shows a peak on the right side with an error of $280\mu\text{m}$, that looks pretty much like a fringe peak, just above the central artifact. It seems to be a known artefact. We see also something at the right position in negative over the artefact which seems to be the correct peak. r_0 around 14-16cm.

UT08:04. Cal1 [HD210129.2019.10.12.08.09](#) S_1 LDC is out of stroke, so we change the REF position from 30 to 40 on W1 to improve the situation. $S_1=-1300$. Excellent tracking by CLIMB. Nice signal on VEGA with 250 photons. $r_0=16\text{cm}$.

UT08:19. Target [HD209458.2019.10.12.08.20](#). Nice CLIMB fringes $S_1=-1320$. Seeing always excellent. Very good tracking by CLIMB. 90 photons on VEGA, just wait...The same feature appears again on the spectral density. Probably ok, weak fringes.

UT08:38: Cal1 [HD210129.2019.10.12.08.46](#) but we install POP5 on W1 first to improve the situation. $S_1=-1300$. Tracking not a good as before, elevation $<35^\circ$. Very nice fringes on VEGA. r_0 between 16-19cm... Tracking CLIMB ok.

UT08h55: Target [HD209458.2019.10.12.08.56](#). Elevation 30° at beginning. Tracking CLIMB ok but not a good as before. r_0 15-19cm. The quality of this point is not guaranteed... Elevation at the end 28°

UT09:15: cal1 for the last bracket. [HD210129.2019.10.12.09.16](#). Elevation 29° at beginning. Tracking CLIMB ok. Nice fringes on VEGA.

UT09:25: Spectral calibration [D_CM720.2019.10.12.09.26](#)

VNOAO, Shultz S1P4B2-W1P1B3, offset=+150, MR656

UT09:30: we go to NOAO program. LDC are removed on S1 and W1 and POPs are changed. LABAO and check star HD31237. AOs done on S1 but small vignetting on S1 pupil. Alignment on the check. S1=-2460.

UT09:51: target1: [HD36485.2019.10.12.10.10](#). S1=-2150. Very close to the bright del Ori star (20" in declination). Fringes found but OPLE server needs to be restarted. 60 blocks. Tracking quite good on CLIMB, r0 values are much fainter but probably an effect of the number of photons. 1 peak is seen on VEGA, too close to the central column. -30 μ m sent after 15 blocks. Erase. Nothing clearly seen at block 30. Tracking CLIMB not really good. 130 photons and probably something is correctly integrating. After doing the second star, it is probable that the fringes on this one (HD36485) are probable not at the right position but the tracking should be ok.

UT10:37: check star to verify the dispersion correction, realignment of NIRO and of S1's AO. Fringes are shifted by 150 μ m. We correct the cophasing to have them at the right place. 2nd target [HD37017.2019.10.12.10.58](#). Fringes ok on the target, well seen and at the right position now. Good tracking with CLIMB. From time to time 10 μ m of correction to keep the VEGA peak always at the same position. It works fine and the fringes seem nice. Very good tracking on CLIMB.

UT11:25: Next target [HD37479.2019.10.12.11.27](#). Nice tracking with CLIMB. Even stronger fringes on VEGA for this one. Very nice sequence on this star with few 10 μ m corrections to keep the fringes at the correct position. CLIMB tracking is very nice despite the magnitude. CLIMB is at 200Hz. 10 μ m every 3-4mn

UT11:53: HD31237 for improving the NIRO alignment. Then target HD36485. Very weak fringes on CLIMB, very hard to see them. No fringes seen on VEGA. S1=-2050. It looks like we will not been able to correct the dispersion.

UT12:10. Again HD37017 but V^2 is lower now than before. Fringes ok with CLIMB. Hard on VEGA and no fringes seen. So we come back to HD37479 (better V^2 and more flux). But no fringes at all. Very strange, we come back to the check but problem of delay. We go to POP3 on S1; AO on S1 to be done. Very nice fringes on CLIMB but very hard time on VEGA. This star is a SB. So we try another check star: HD34503 but no better luck. Finally at 13h20 we give up.

UT13:18: Spectral calibration [D_CM656.2019.10.12.13.19](#)