TJAN24 Correlation Report

General information

- Fringe test between PV and NOEMA (single antenna) at 3mm
- Done with the EHT setup 4x2GHz dual-pol
- PV with 2-of-4 x R2DBE and 1 x DBBC3; on sky demonstration of DBBC3 GMVA fringes
- PV had poor IF bandpass equalization, and NOEMA had low optical power in parts of Rx LSB
- Fringe SNR drops notably from b1&b2 (good SNR) to b3&4 (low SNR). Same behaviour in e20j23 but with opposite backend assignment at PV rules out backend issues. Haystack is still to correlate e20j23 NOEMA data with rest of Jan 2020 DR stations (except for PV), remains to be seen if a NOEMA issue, or PV.

Fringes

Baseline	Band	Fringes	Plots	Comments
Na -Pv	band1	OK	No0030_b1.pdf ..._32x64M.pdf	Na:r2dbe1 x Pv:dbbc
Na -Pv	band2	OK	No0030_b2.pdf ..._32x64.pdf	Na:r2dbe2 x Pv:dbbc
Na -Pv	band3	OK	No0030_b3.pdf ..._32x64M.pdf	Na:r2dbe3 x Pv:r2dbe2
Na -Pv	band4	OK	No0030_b4.pdf ..._32x64M.pdf	Na:r2dbe4 x Pv:r2dbe1

A-list files

Entire 3-scan tjan24 correlated with 2 x 512 MHz zoombands: alist for b1 b2 b3 b4

Entire 3-scan tjan24 correlated with 32 x 64 MHz zoombands: alist for b1 b2 b3 b4

Notes

- Email Bremer (28.1.2020) :

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...Wenn ich Olivier richtig  verstanden habe, sollte die Richtung der
R2DBE Spektren im LSB invers zu der Himmelsfrequenz laufen (da gab es mal
ein Mißverständnis), im USB mit der Himmelsfrequenz, und wir sollten
Signal auf 100-1700 MHz haben in dem 0-2048 MHz Band.
LO1  Frequenz war 92.101000 GHz, wir sind also 1 MHz verschoben relativ
zu Pico.
Unser 1PPS Signal sollte einen mittleren Null Offset relativ zu GPS
haben, ich hoffe, die Zero Crossings werden Euch nicht stören. Drift
sollte sehr klein sein, unser Fit gab zero Drift. VLBI antenna war A9,
auf Pad Position E03   4523999.442, 468067.530, 4460310.069 (nach Dave
Graham's Skript).
Wir waren für alle 3 Scans auf der 5 MHz Referenz der Masers, genau wie
für die 1.3 mm Daten. Die Quellen wurden lokal sehr gut detektiert.
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- Email Bremer (5.2.2020) :

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LSB: B1:Fsky=LO1-7000-IF_R2DBE, B2:Fsky=LO1-5000-IF_R2DBE
B1: in the R2DBE [0, 2048] MHz => on the sky [85101, 83053] MHz
B2: in the R2DBE [0, 2048] MHz => on the sky [87101, 85053] MHz
USB: B3:Fsky=LO1+5000+IF_R2DBE, B4:Fsky=LO1+7000+IF_R2DBE
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B3: in the R2DBE [0, 2048] MHz => on the sky [97101, 99149] MHz
B4: in the R2DBE [0, 2048] MHz => on the sky [99101, 101149] MHz
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- Gino Tuccari (5.2.2020) :

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The 0-2G|2-4G FIRs do not flip the baseband orientation.
The baseband orientation depends on the 4-12G IF, Valon LO tuning, analog
filtering.

--tjan24: in practice, oct2-4 is flipped by FIR/shift, oct0-2 is not
flipped!
Also seen at Pico with spectral line.
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Basebands

- NOEMA signal chain

Band	backend	recorder	sky	netSB	
b1: LSB hi	r2dbe1	recorder1 (Mark6-4129); collected	83053 - 85101	lsb	
b2: LSB_lo	r2dbe2	recorder2 (Mark6-4124); collected	85053 - 87101	lsb	
b3: USB_lo	r2dbe3	recorder3 (Mark6-4130); collected	97101 - 99149	usb	
b4: USB_hi	r2dbe4	recorder4 (Mark6-4131); collected	99101 - 101149	usb	

- Pico calculations

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1st LO 92100
B3,B4 : 1st USB : bdc1 5-7|7-9 at 99100M mid : 5-7:97052..99100 |
7-9:99100..101148
B1,B2 : 1st LSB : LO 9.048G lsb : net usb start at 83052M :
oct0-2:83052-85100 | 2-4:85100-87148
```

- PV signal chain

Band	backend	recorder	sky	netSB	
b1: LSB hi	DBBC3	recorder4; collected	83052 - 85100	usb	
b2: LSB_lo	DBBC3	recorder3, as-is	85100 - 87148	lsb	
b3: USB_lo	r2dbe2	recorder2; collected	97052 - 99100	lsb	
b4: USB_hi	r2dbe1	recorder1; collected	99100 - 101148	usb	

Issues

- Data weights for PV-RR are reduced. On the 4-module set containing "hand-carry" copies of the other 4-set modules, copied modules have 6 out of the 16 fragment files per scan missing. Apparantly the copy procedure was incomplete. Affects bands 1, 3, and 4.