

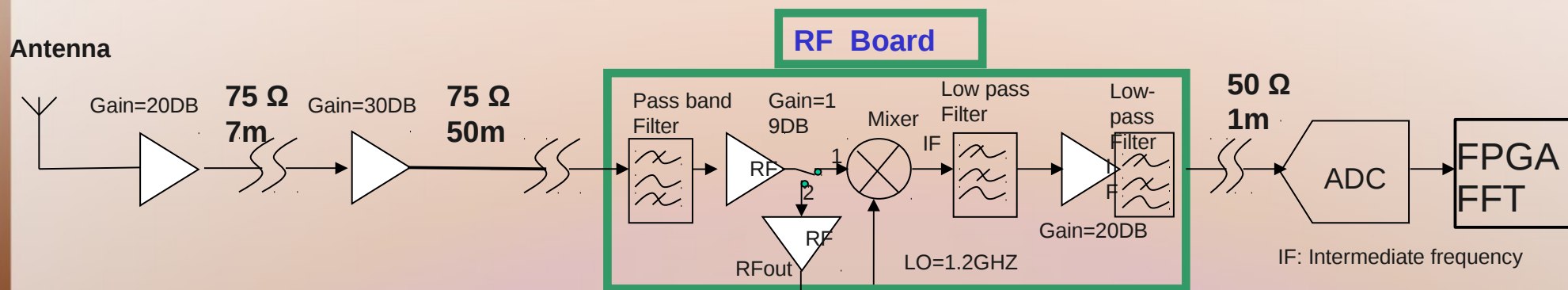


BAO

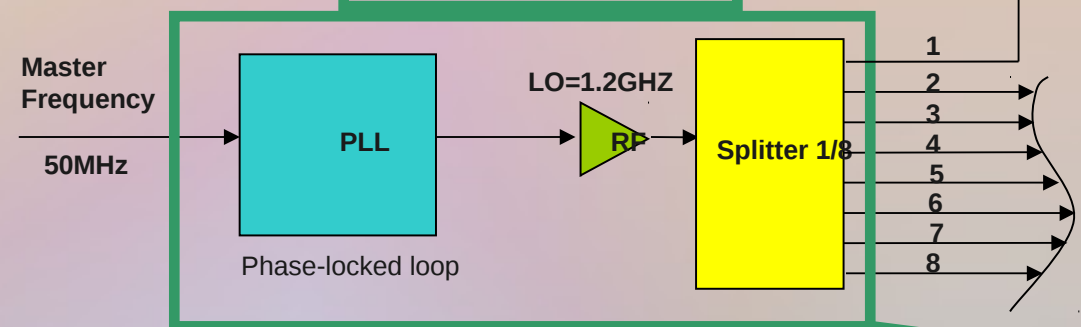
- Current Electronics
- Electronics up-grade
 - Analog
 - Digital
- Undersampling results



Current analogue chain



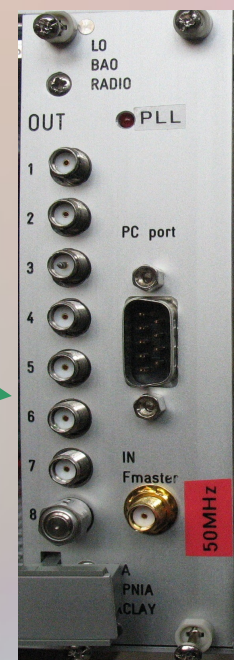
LO Prototype Board



Local Oscillator RF amplifier, mixer

RF board:

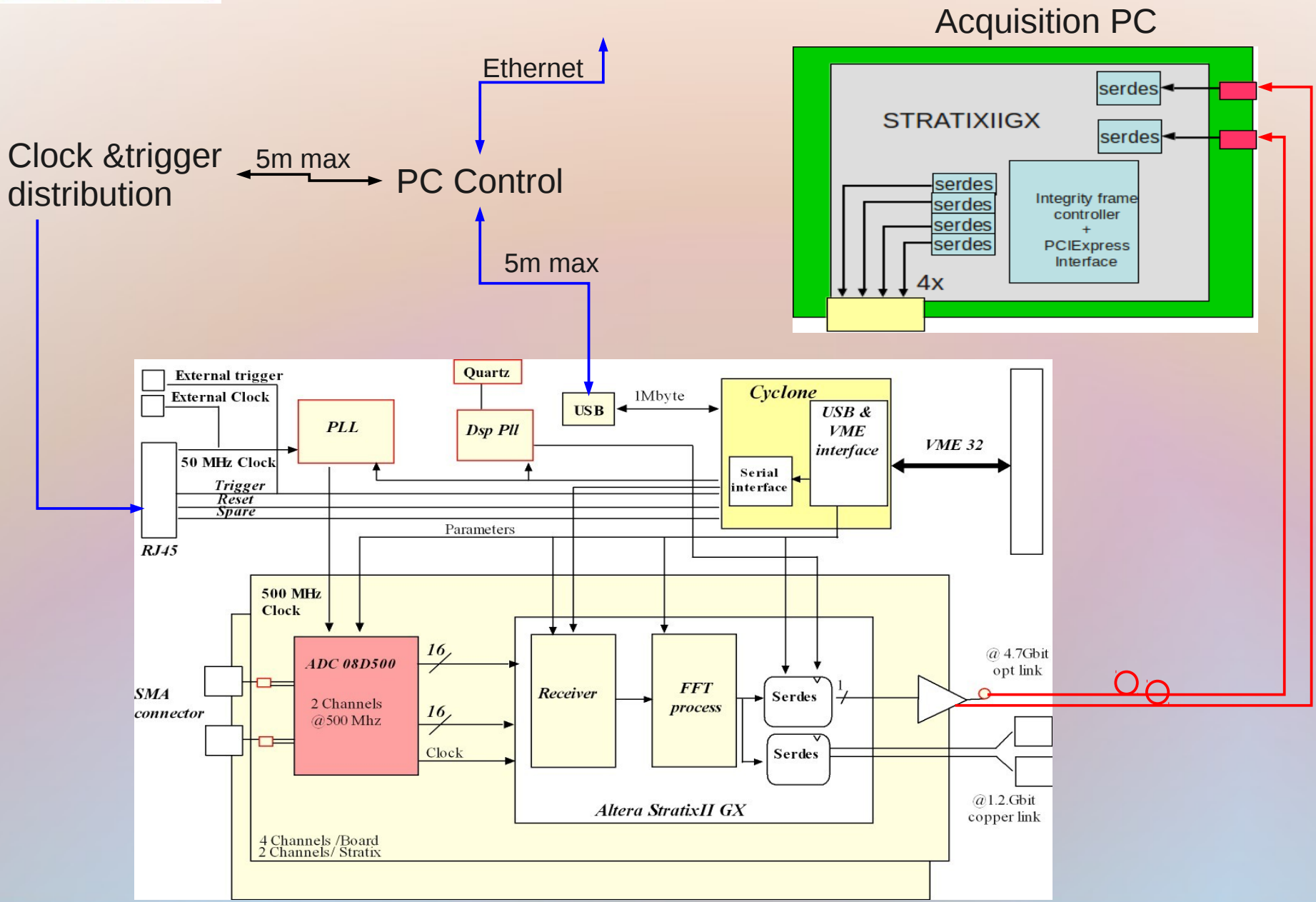
- 75Ω/50Ω inputs
- 2 channels per board
- Possibility of by-passing mixer to test the under-sampling approach.



Front panel plug-in (3U EuroCard)

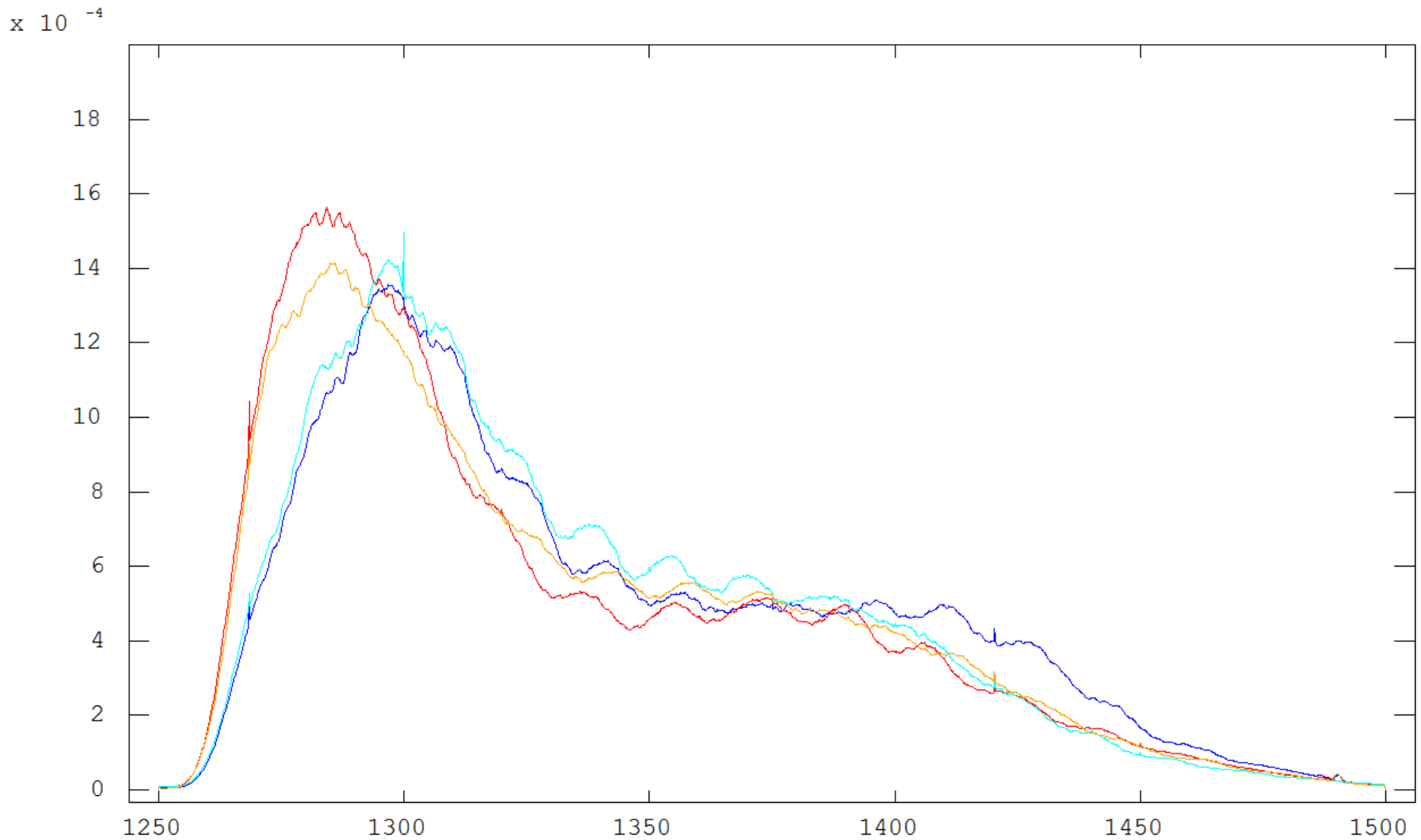


Current numerical chain



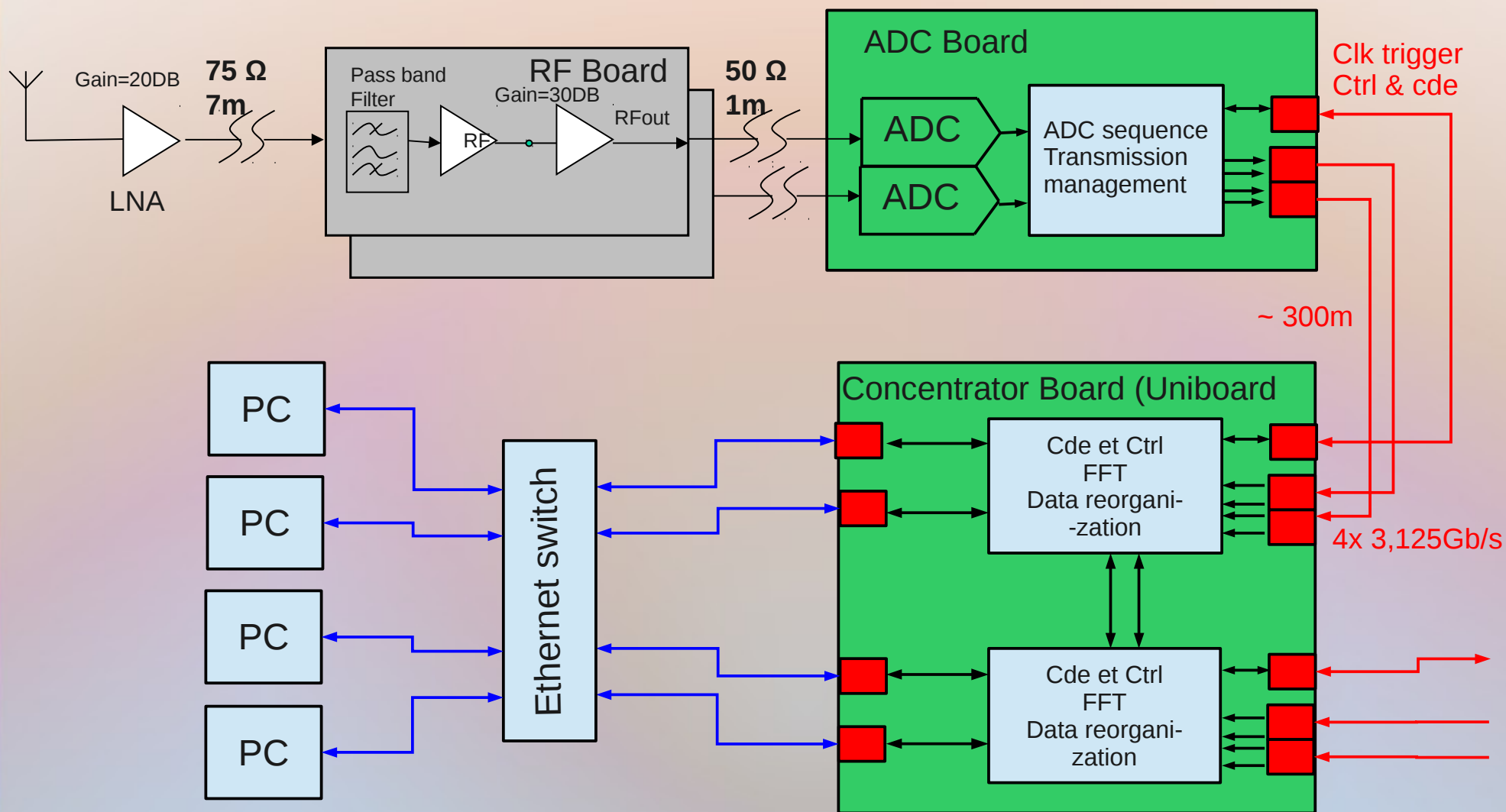


analogue problem



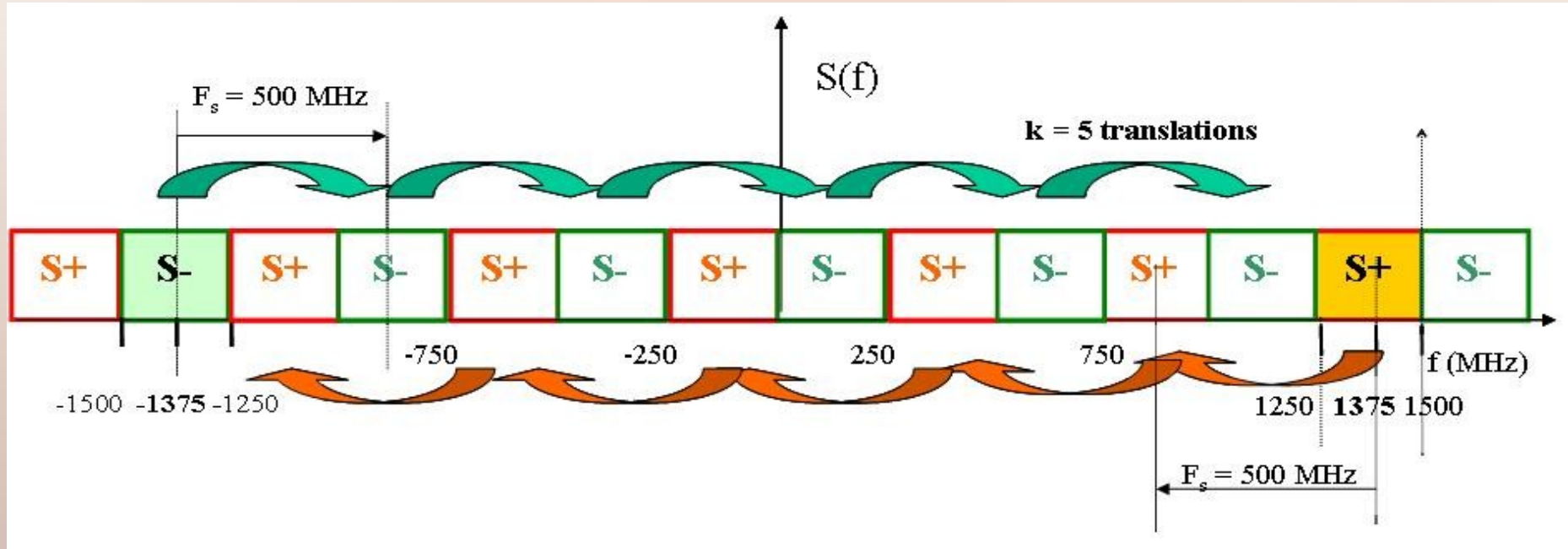


Future BAO electronic system





Under-sampling theory



Frequency 1250MHz-1500MHz

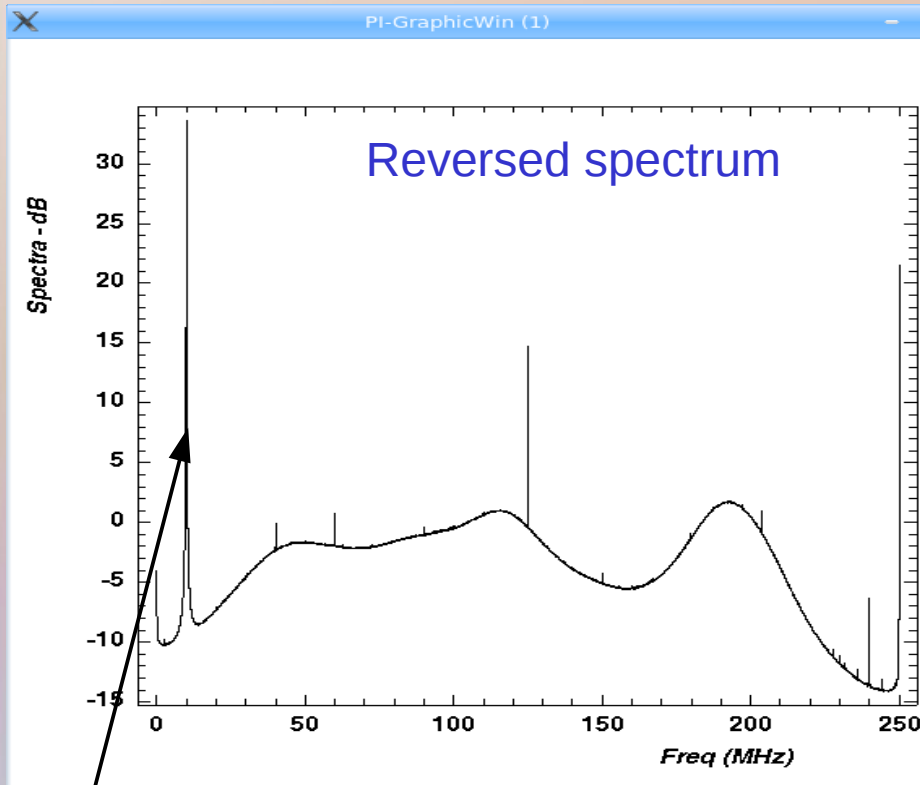
Frequence centrale (MHz)	demi-bande	freq basse	freq. Haute	Ordre du sous-echantillonnage	k	F_s Mini	F_s Maxi
vc	B	$vc - B$	$vc + B$	$(vc - B)/2B$		$2(vc + B) / (k+1)$	$2(vc - B) / k$
1375	125	1250	1500	5	5	500	500
1375	125	1250	1500		4	600	625
1375	125	1250	1500		3	750	833



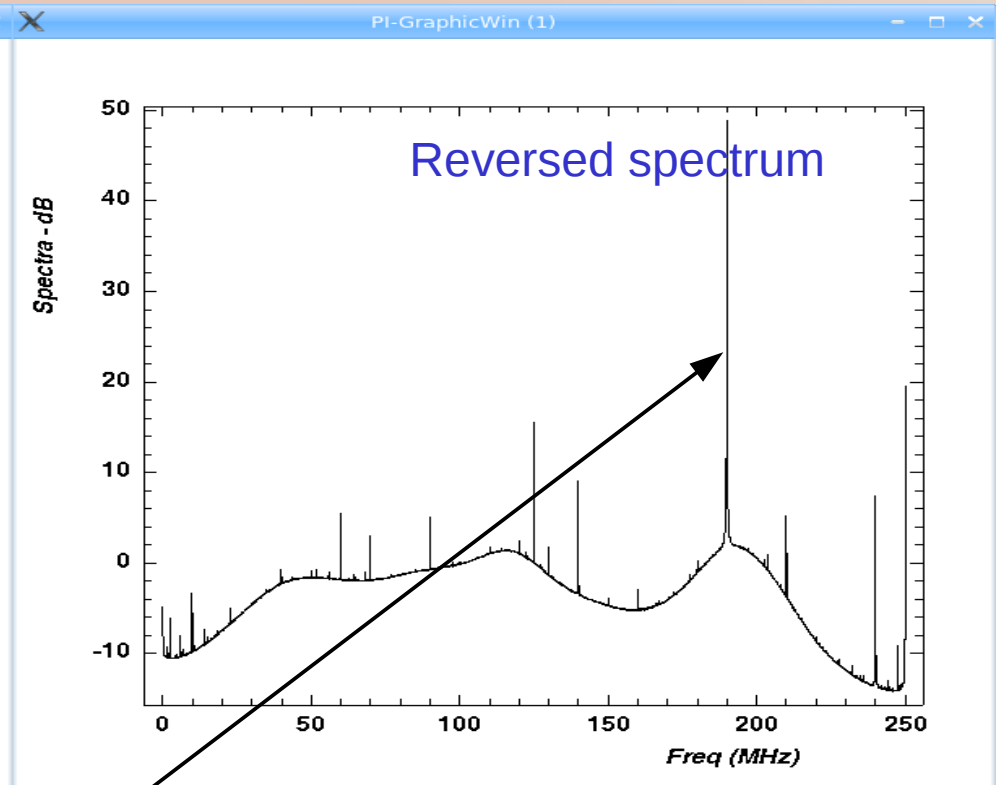
Under-sampling result 1

Signal frequency : $F=1490$ MHz
(high limit)

Signal frequency : $F=1310$ MHz



$$10 \text{ MHz} = -1490 \text{ MHz} + 3 \times 500 \text{ MHz}$$



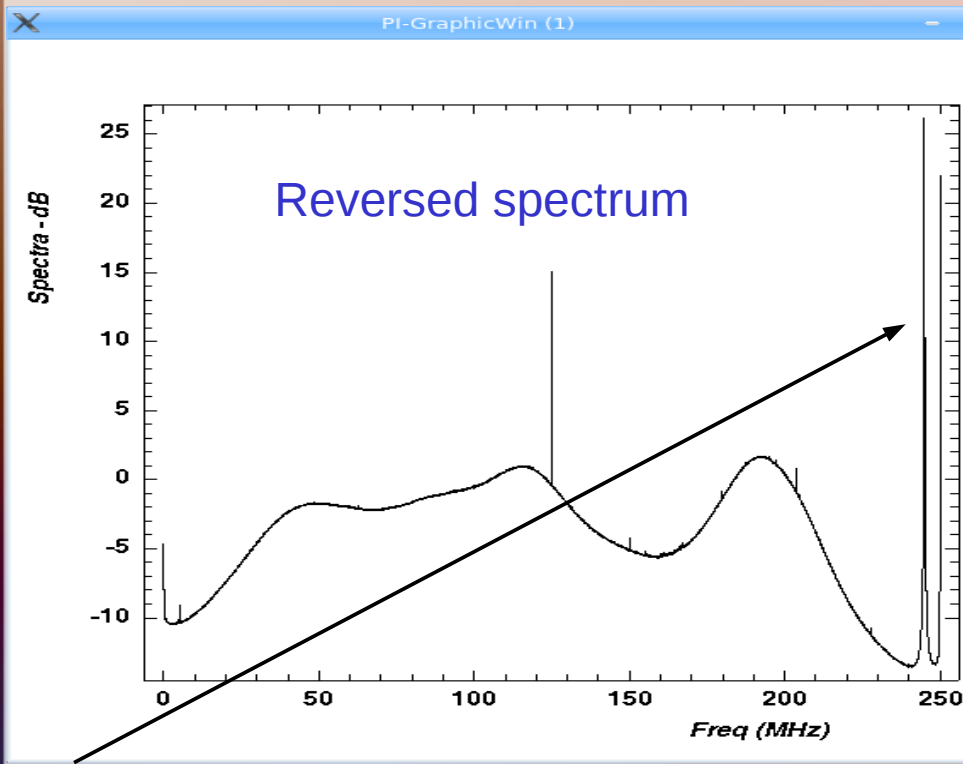
$$190 \text{ MHz} = -1310 \text{ MHz} + 3 \times 500 \text{ MHz}$$



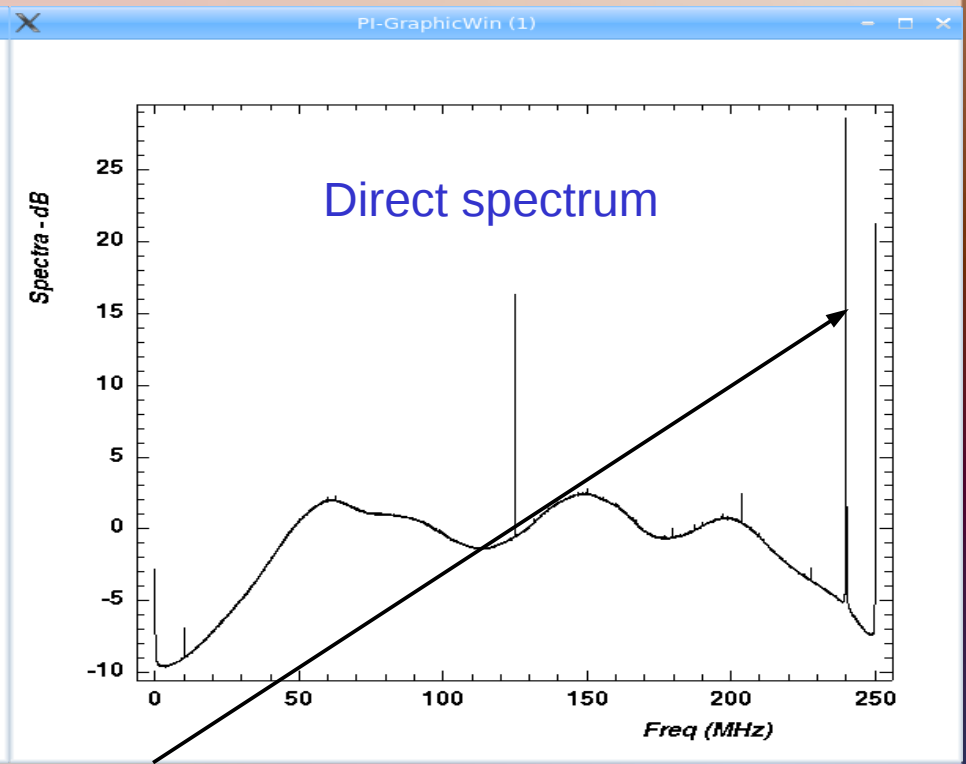
Under-sampling result 2

Signal frequency : $F=1255$ MHz
(low limit)

Signal frequency : $F=1240$ MHz
(outside the BW)



$$245 \text{ MHz} = -1255 \text{ MHz} + 3 \times 500 \text{ MHz}$$



$$240 \text{ MHz} = 1240 \text{ MHz} - 2 \times 500 \text{ MHz}$$



conclusion

- With a sampling rate of 500 MHz, the spectrum inside the bandwidth [1250 MHz -1500 Mhz] is translated and reversed between 0 and 250 MHz.
- To avoid the spectrum overlap, it is necessary to filter the useful band.
- Test on PAON2 schedule the 17/7