Santy check filtering or without filtering signal

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1 Introduction

Here, we are tested 3 different Traumschreiber (Number 3,4 and 7) with different channels 1,8 and 24 for each.

2 Setup

2.1 Test 1

5Hz and 5mvolt Signal is injected to channel 1,8 and 24 separately of Traumscheriber No 3 and 4(Internal Reference, pairwise difference) and Traumscheriber no7 (External Reference, Common Reference). Each of the Traumschreiber has filter-on image.

2.2 Test 2

The same experience is repeated by without filtering image.

2.3 Test 3

Traumaschreiber no 4 (filter-on)and 7 (filter-off) are also tested in channel 8 with the Frequency Neighboring effect by injecting (10 Hz,5 volts) signal to channel 9 to see the effect.

3 Test 1

3.1 Traumschreiber 4

Here, we can see the result of the Traumscheriber no.4, channel 1 with **filter-on image** on the board. The injected signal is 5Hz, 5mvolt.

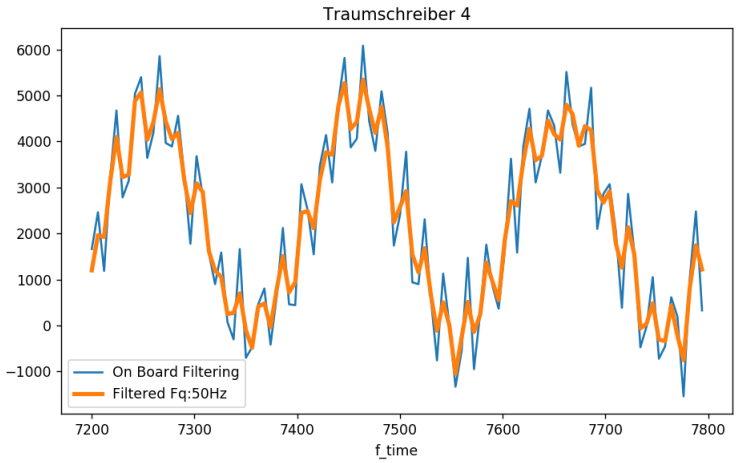
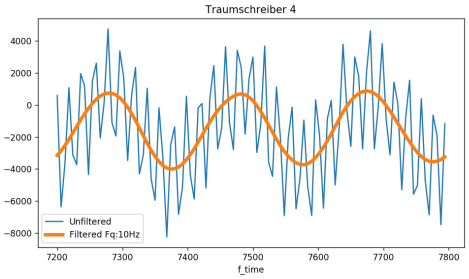


Figure 1: Traumschreiber no.4, Channel 1, 5Hz,5mvolt

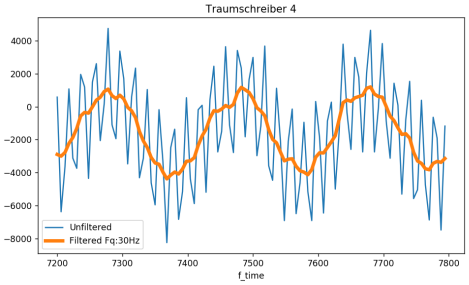
4 Test 2

4.1 Traumschreiber 4

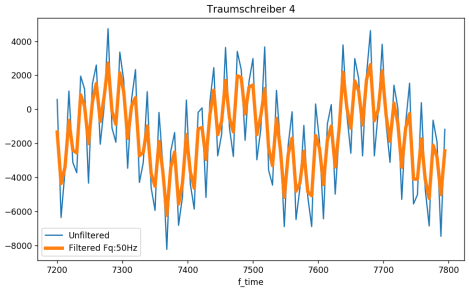
Here, we can see the result of Traumscheriber no.4, channel 1 with **filter-off image** on the board. The injected signal is 5Hz, 5mvolt. Applying 3 different separate low pass filtering cutoff (10Hz,30Hz, and 50Hz)



(a) Traumschreiber no.4, Channel 1, 5Hz,5mvolt,lowpass 10hz



(b) Traumschreiber no.4, Channel 1, 5Hz,5mvolt,lowpass 30hz

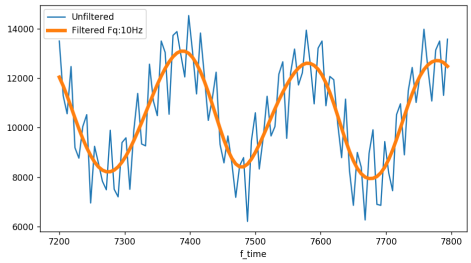


(c) Traumschreiber no.4, Channel 1, 5Hz,5mvolt,lowpass 50hz

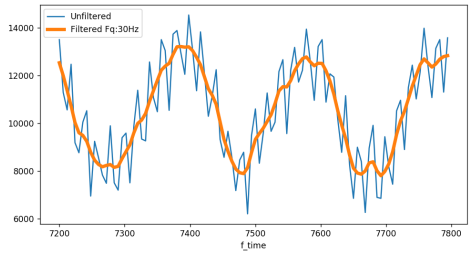
Figure 2: Traumschreiber 4,Ch1

4.2 Traumschreiber 3

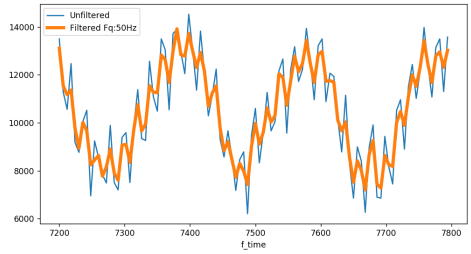
Here, we can see the result of Traumscheriber no.3, channel 1 with **filter-off** image on the board. The injected signal is 5Hz, 5mvolt. Applying 3 different low pass filtering cutoff (10Hz,30Hz and 50Hz)



(a) Traumschreiber no.3, Channel 1, 5Hz,5mvolt,lowpass 10hz



(b) Traumschreiber no.3, Channel 1, 5Hz,5mvolt,lowpass 30hz

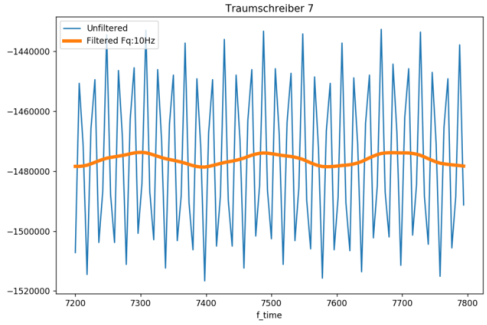


(c) Traumschreiber no.3, Channel 1, 5Hz,5mvolt,lowpass 50hz

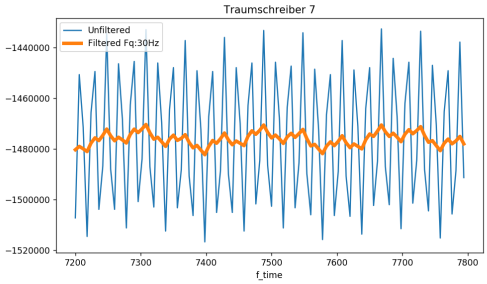
Figure 3: Traumschreiber 3,Ch1

4.3 Traumschreiber 7

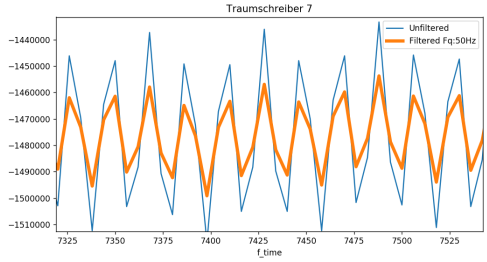
Here, we can see the result of Traumscheriber no.7, channel 1 with **filter-off** image on the board. The injected signal is 5Hz, 5mvolt. Applying 3 different low pass filtering cutoff (10Hz,30Hz, and 50Hz)



(a) Traumschreiber no.7, Channel 1, 5Hz,5mvolt,lowpass 10hz



(b) Traumschreiber no.7, Channel 1, 5Hz,5mvolt,lowpass 30hz



(c) Traumschreiber no.7, Channel 1, 5Hz,5mvolt,lowpass 50hz

Figure 4: Traumschreiber 7,Ch1

5 Test 3

5.1 Neighboring effect of Traumschreiber 4 (filter-on)

Channel 8 with Frequency Neighboring effect.Injecting (10 Hz,5 volts) signal to channel 9 to see the effect.

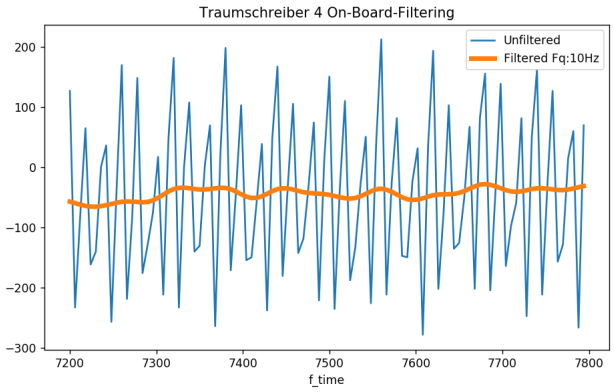


Figure 5: Traumschreiber no.4, Channel 8, 5Hz,5mvolt,lowpass 10hz

5.2 Neighboring effect of Traumschreiber 7 (filter-off)

Channel 8 with Frequency Neighboring effect.Injecting (10Hz,5mvolts) signal to channel 9 to see the effect

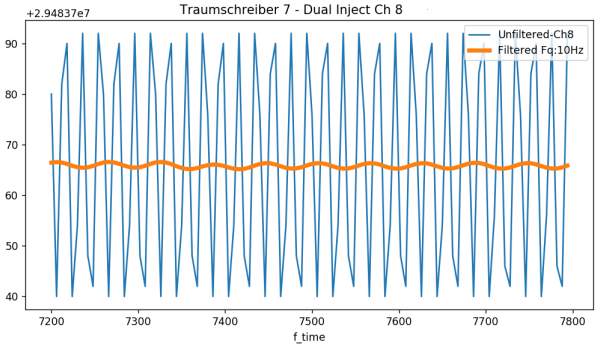


Figure 6: Traumschreiber no.7, Channel 8, 5Hz,5mvolt,lowpass 10hz

6 Conclusion

According to the results, we can discuss that applying a lowpass filter only has a good effect on an original signal with cute-off lower than 30Hz. lowpass filter still some kinda effect on the raw signal with 50Hz cute-off frequency but not completely.
In comparison, the filter-on or filter-off image on the Traumschreiber board has not eye-catching effect to improve our signal and maybe we need to recheck the codes again.
The neighboring effect on Traumschreiber 4 and 7 is investigated on channel 8. Although one of them has the filter-on image and the other filter-off image, I personally think that we still can be concluded that the bad effect of neighboring 10Hz frequency after applying bandpass filter on Traumschreiber 4 is because Traumschreiber 4 is pairwise reference. we could not see this bad effect on Traumschreiber 7 maybe because Traumschreiber 7 has a common reference