

Signals, Systems and Modulations

Laboratory no. 4

May 22, 2023

LABORATORY GROUP MEMBERS:

Jan Choraży

Krzysztof Watras

Computer Science
Politechnika Warszawska

1 Introduction

During Laboratory 4 we study the efficiency of different filters given a noisy signal. In one time period there are 2400 readings.

2 Measurement results

We observe the signal without any filter first to establish what is a theoretical worst number of errors. We observe an average of 552 errors in one time period. This is equivalent to 23% error rate that is quite terrible for any application.

Second, we study the R_c filter setup in different filter bands set. We get measurements the same as in table below. As you can see on Figure ??, the

Table 1: Results of R_c filter setup

Filter band [kHz]	Amount of errors
1.5	35
2	30
3	25
4	23
6	45

best filter band in this setup is equal to 4[kHz], with error count of 18.

After that, we study the $2R_c$ setup. Similarly to previous task, we explore the best band to get the lowest error count. Measurement are given below. As

Table 2: Results of $2R_c$ filter setup

Filter band [kHz]	Amount of errors
1.5	50
2	32
3	18
4	23
6	35

you can see on Figure ??, the best filter band in this setup is equal to 3[kHz], with error count of 18.

Finally, we measure the signal using the optimal filter. This way, we get the best number of errors, equal to 15 errors in one period.