Informationsübertragung

Testataufgaben

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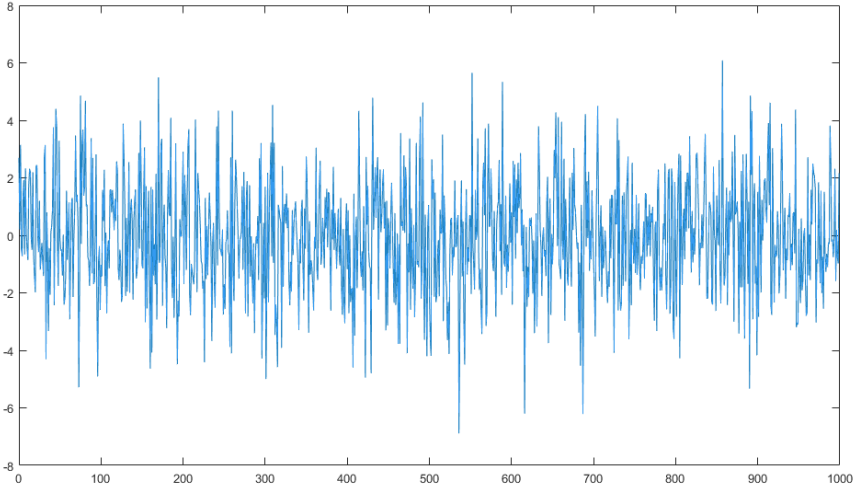
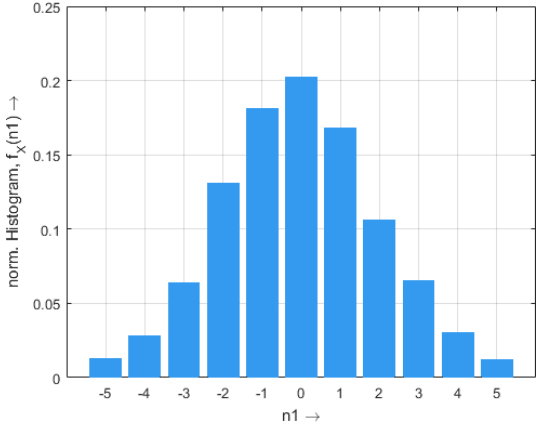
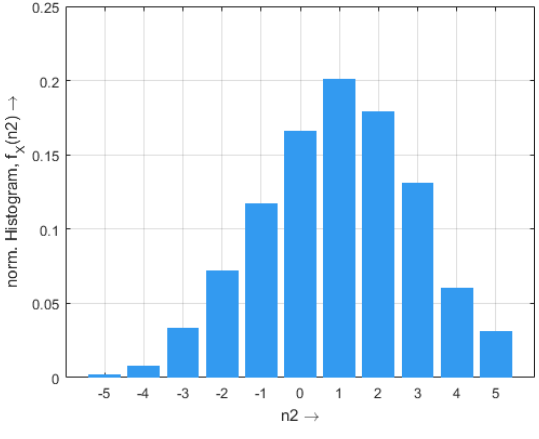
Aufgabe 1: Rauschanalyse



Aufgabe 1: Rauschanalyse





Aufgabe 1: Rauschanalyse

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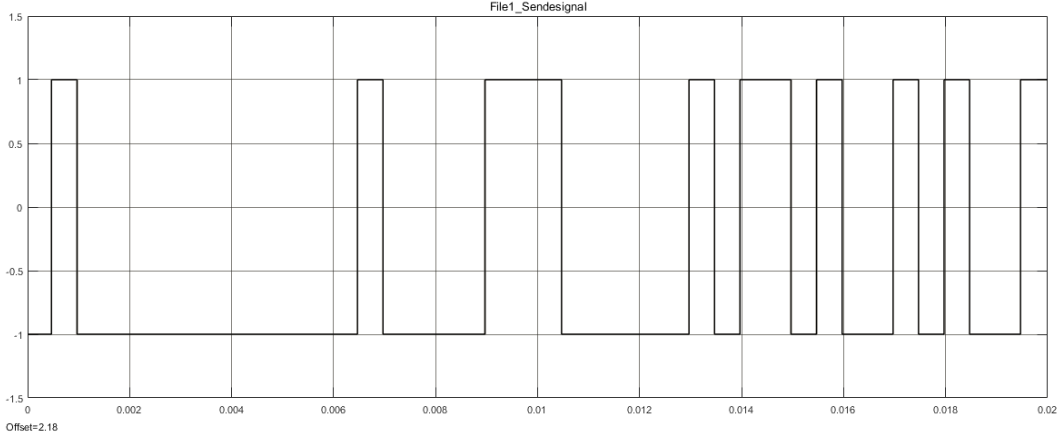
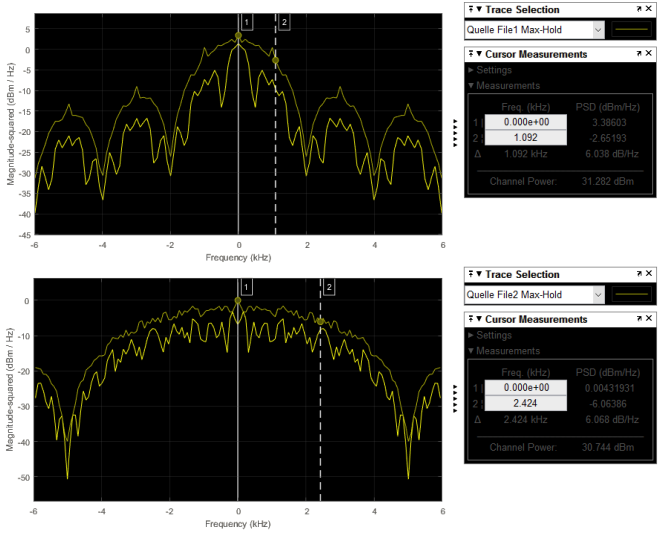
...
xmue1 = mean(n1)
var1  = var(n1)
...
```

Signal	Mittelwert	Varianz
$n_1(t)$	-0.06	4.00
$n_2(t)$	0.96	3.94

Aufgabe 2: Basisband I



Aufgabe 2: Basisband I



Aufgabe 2: Basisband I

Signal	Datenrate (BR)	Bandbreite ($6\,\mathrm{dB}$ (B))
File 1	$2.001\,\mathrm{kbit\,s^{-1}}$	$1.092\,\mathrm{kHz}$
File 2	$5.006\,\mathrm{kbit\,s^{-1}}$	$2.424\,\mathrm{kHz}$

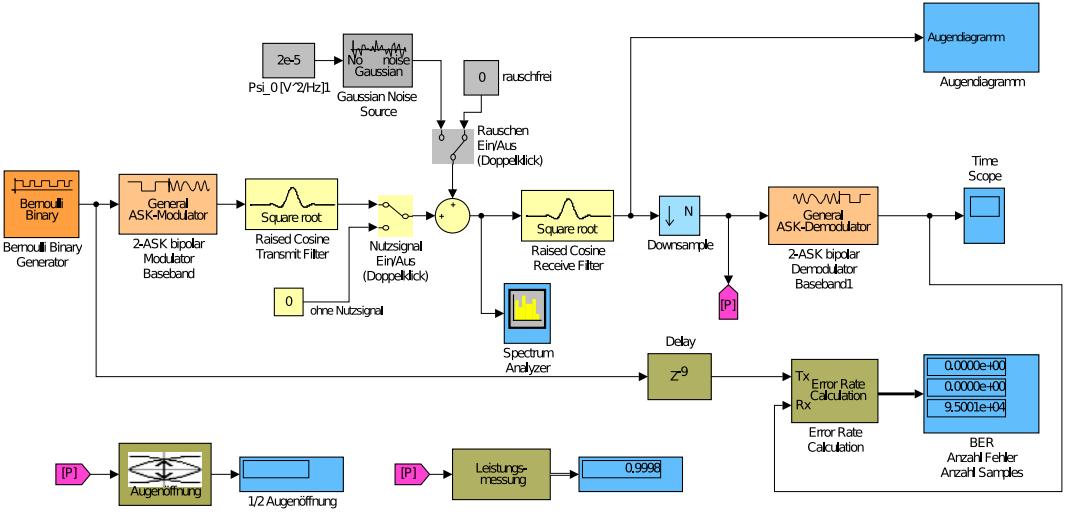
Inetwa linearer Zusammenhang:

$$B \approx \frac{1}{2} \cdot BR = \frac{1}{2} \cdot \frac{1}{T_S}$$

$\rightarrow$ Bandbreite bei $1\,\mathrm{kbit\,s^{-1}}$:

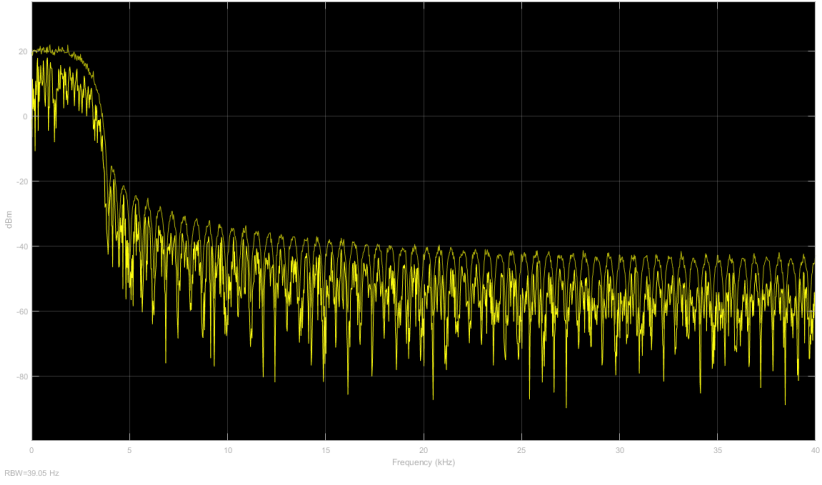
$$B \approx \frac{1}{2} \cdot 1000\,\mathrm{kbit\,s^{-1}} = 500\,\mathrm{Hz}$$

Aufgabe 3: Basisband II



Aufgabe 3: Basisband II

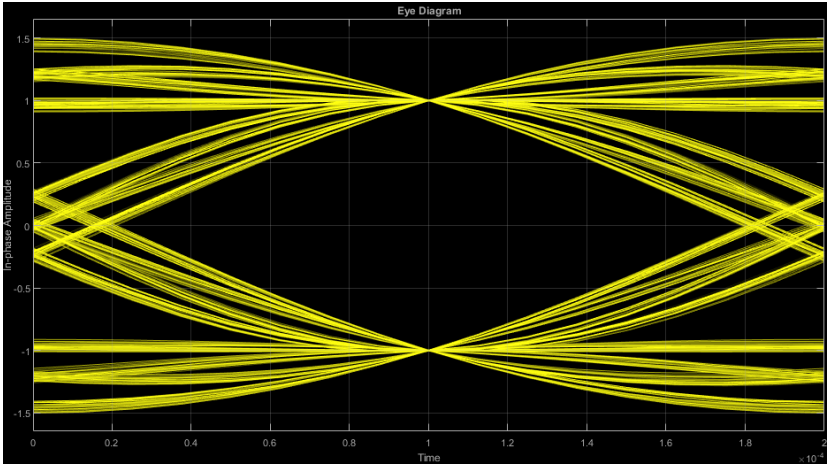
$B \approx 2.76\,\text{kHz}$



Aufgabe 3: Basisband II

$U_A \approx 0.9965\,\mathrm{V}$

$P_R \approx 0.1\,\mathrm{V}^2$



Aufgabe 3: Basisband II

$$\mathrm{BER} = \frac{1}{\log_2 s} + \frac{s-1}{s} \cdot \mathrm{erfc}\left(\sqrt{\frac{\rho}{2}}\right),\ s = 2$$

$$\mathrm{BER} = 0.5 \cdot \mathrm{erfc}\left(\sqrt{\frac{9.93}{2}}\right) = 8.1303 \cdot 10^{-4}$$

gemessen:

$$\mathrm{BER}_g = 8.86315 \cdot 10^{-4}$$

Aufgabe 4: Unmatched Empfangsfilter (Arbeitstitel)

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