

1.

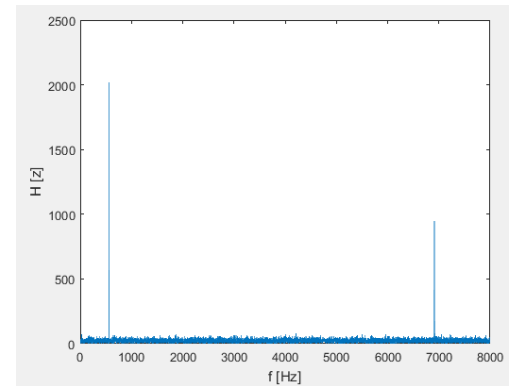
Vzorkovací frekvence signálu : **16 000Hz**

Délka signálu: **16 000 vzorků : 1s**

```
[SOUNDDADA,SAMPLERATE] = AUDIOREAD('XTICHY26.WAV');
SAMPLECOUNT=LENGTH(SOUNDDADA);
TIME=SAMPLECOUNT/SAMPLERATE;
```

2.

```
FOURIERTransformationOriginal = FFT(SOUNDDADA);
VECTOR = (0:SAMPLECOUNT-1)*SAMPLERATE/SAMPLECOUNT;
MODULEORIGINAL = ABS(FOURIERTransformationOriginal);
PLOT(VECTOR(1:SAMPLECOUNT/2),
MODULEORIGINAL(1:SAMPLECOUNT/2));
```



3.

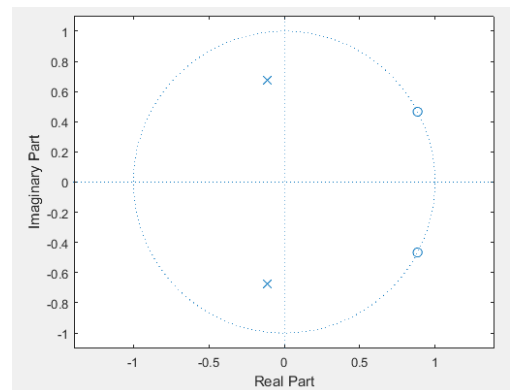
Maximum spektra: **558 Hz**

```
[MAXMODULEORIGINAL, MAXINDEXORIGINAL] = MAX(SYM(MODULEORIGINAL));
MAXORIGINALHERTZ = VECTOR(MAXINDEXORIGINAL);
```

4.

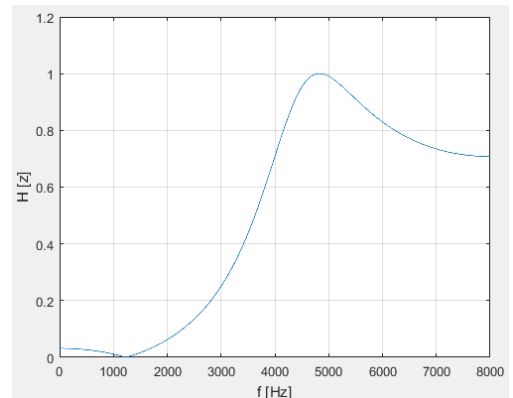
```
A = [1 0.2289 0.4662];
B = [0.2324 -0.4112 0.2324];
ZPLANE(B,A);
```

Absolutní hodnota pólů je menší než jedna = **Filtr je stabilní**



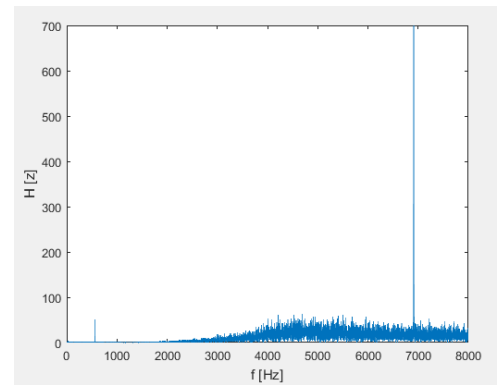
5.

```
FREQ=(0:SAMPLECOUNT-1) / SAMPLECOUNT * SAMPLERATE / 2;
H = FREQZ(B,A,SAMPLECOUNT);
```



6.

```
FILTERED=FILTER(B,A,SOUNDDADA);
FOURIERTransformationFILTERED=FFT(FILTERED);
MODULEFILTERED=ABS(FOURIERTransformationFILTERED);
```



7.

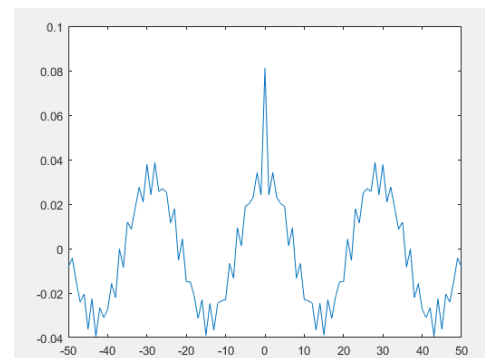
Maximum spektra filtrovaného signálu: **6912 Hz**

```
[MAXMODULEFILTERED, MAXINDEXFILTERED] = MAX(SYM(MODULEFILTERED));
MAXFILTEREDHERTZ = VECTOR(MAXINDEXFILTERED);
```

8.

9.

```
[RV, LAG] = XCORR(SOUNDDADA, 'BIASED');
PLOT(LAG, RV);
XLIM([-50 50]);
```



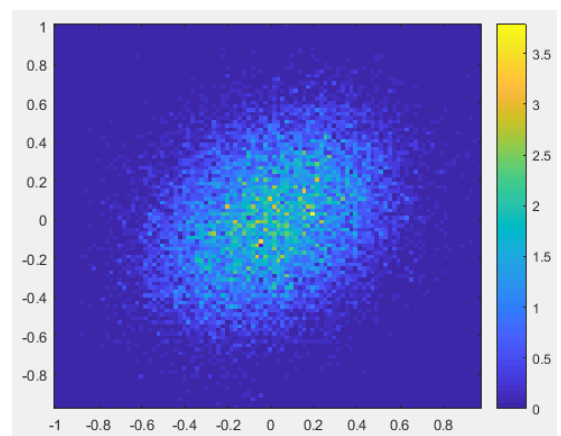
10.

RV[10] = **-0.022941507712821**

RV10 = RV(10 + SAMPLECOUNT);

11.

```
X = Linspace(MIN(SOUNDDADA), MAX(SOUNDDADA), 100);
[H,P,R] =
HIST2OPT(
SOUNDDADA(1:SAMPLECOUNT-10),
SOUNDDADA(11:SAMPLECOUNT),
X
);
```



12.

$$\int_{x_1} \int_{x_2} p(x_1, x_2, 10) dx_1 dx_2 = 1$$

PLATÍ

VÝPOČET SE PROVÁDÍ VE FUNKCI HIST2OPT

13.

RV[10] = -0.0230

Výsledek se liší o 1 tisícinu. Toto bude nejspíše zapříčiněno zaokrouhlováním.

VÝPOČET SE PROVÁDÍ VE FUNKCI HIST2OPT (NÁVRATOVÝ PARAMETR R)