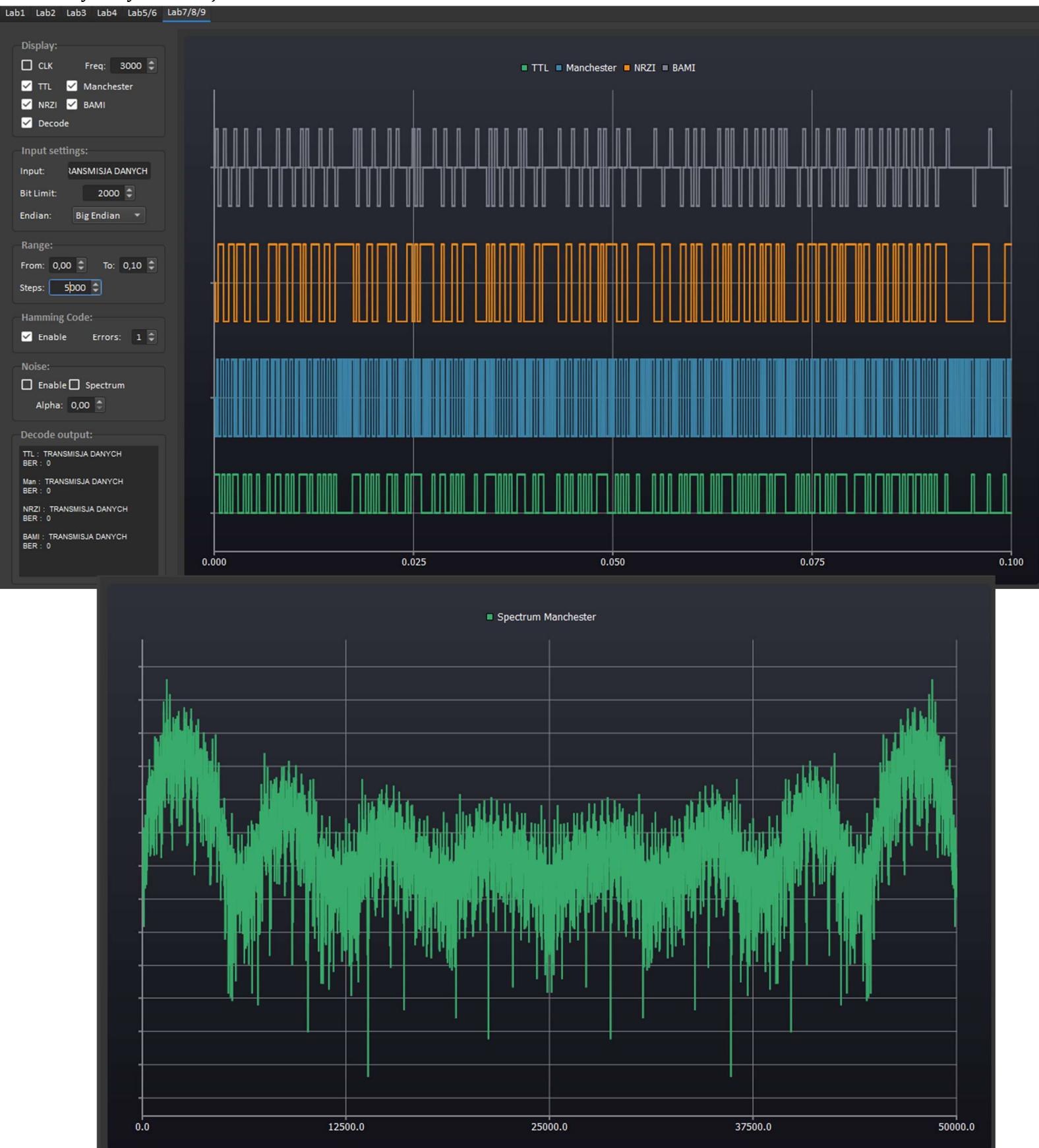


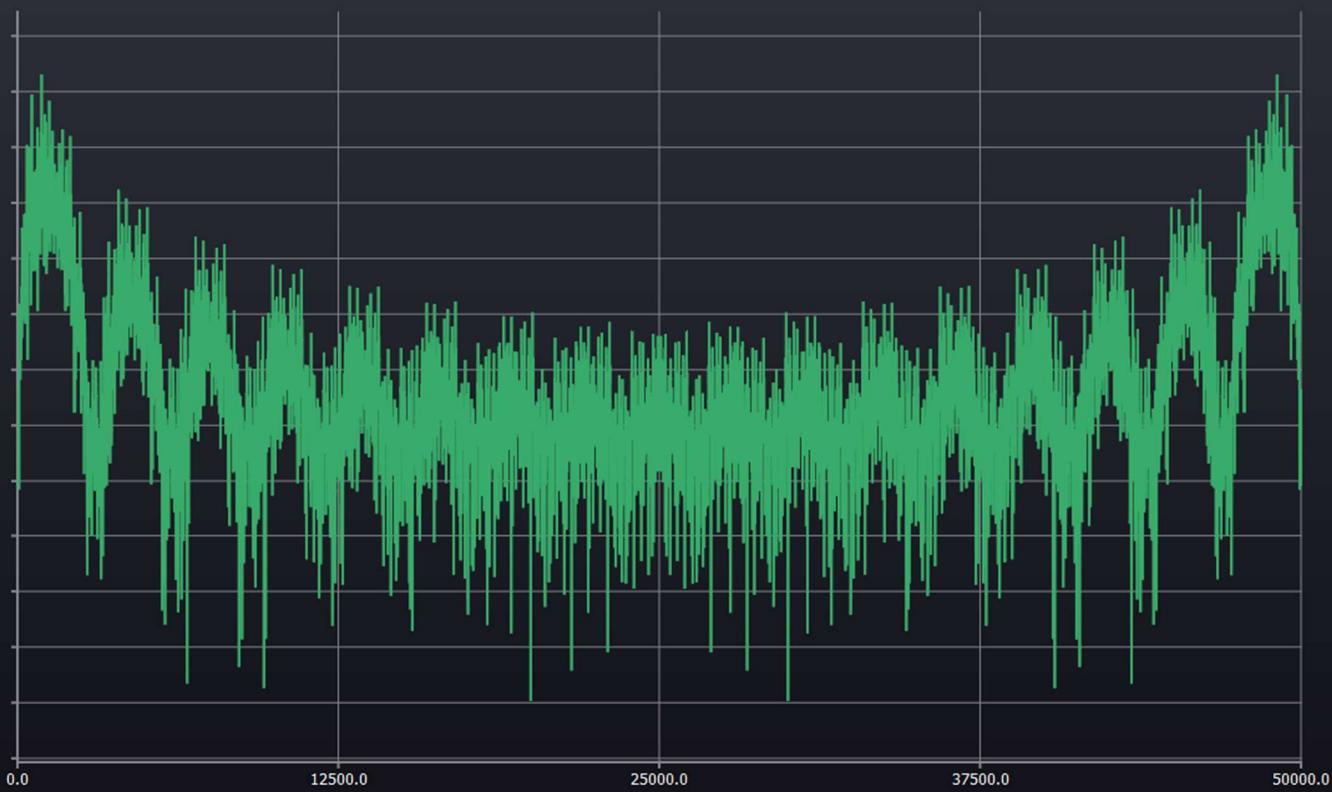
Laboratorium nr 10

1) Pracując na pseudo torze transmisyjny z poprzednich zajęć wygeneruj wykresy widm amplitudowych trzech modulacji na etapie oznaczonym jako nr 3.

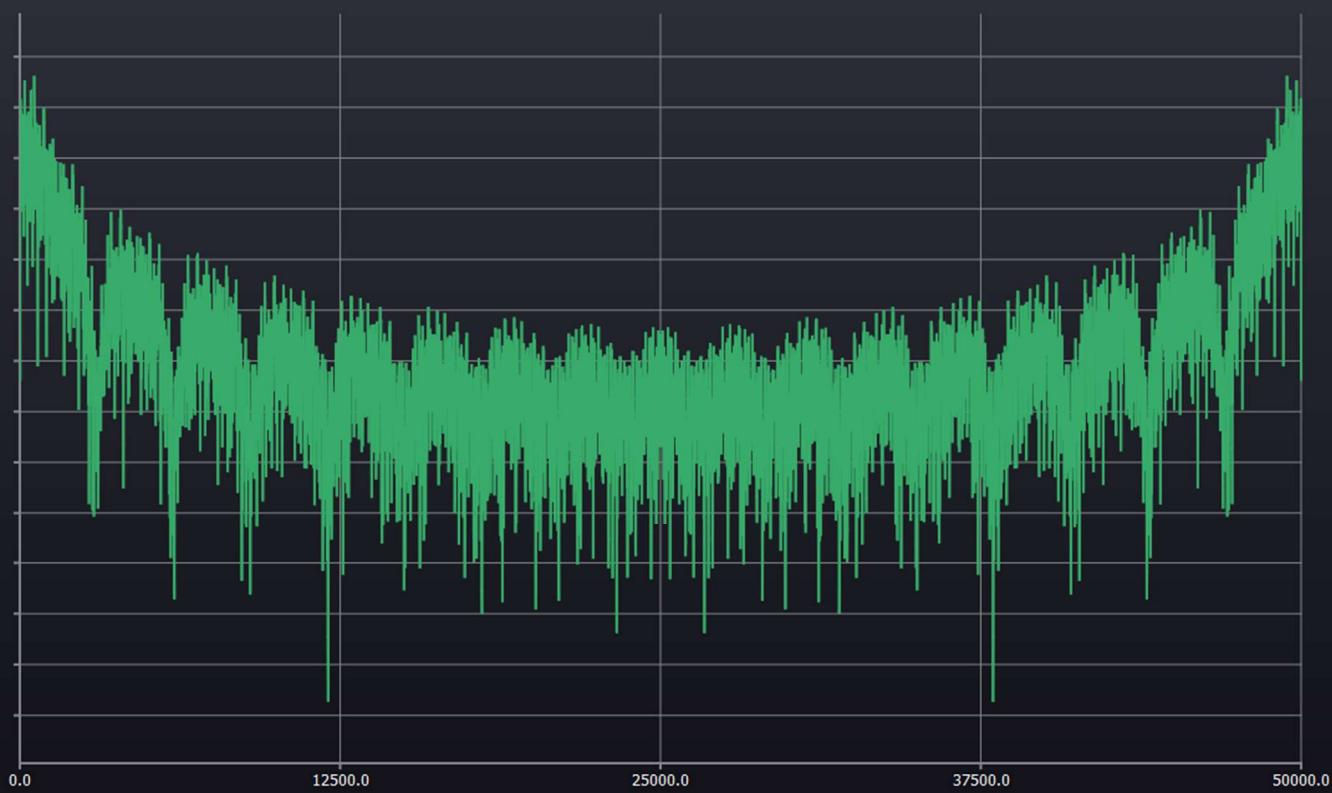
Wykresy modulacji i widm bez szumu:



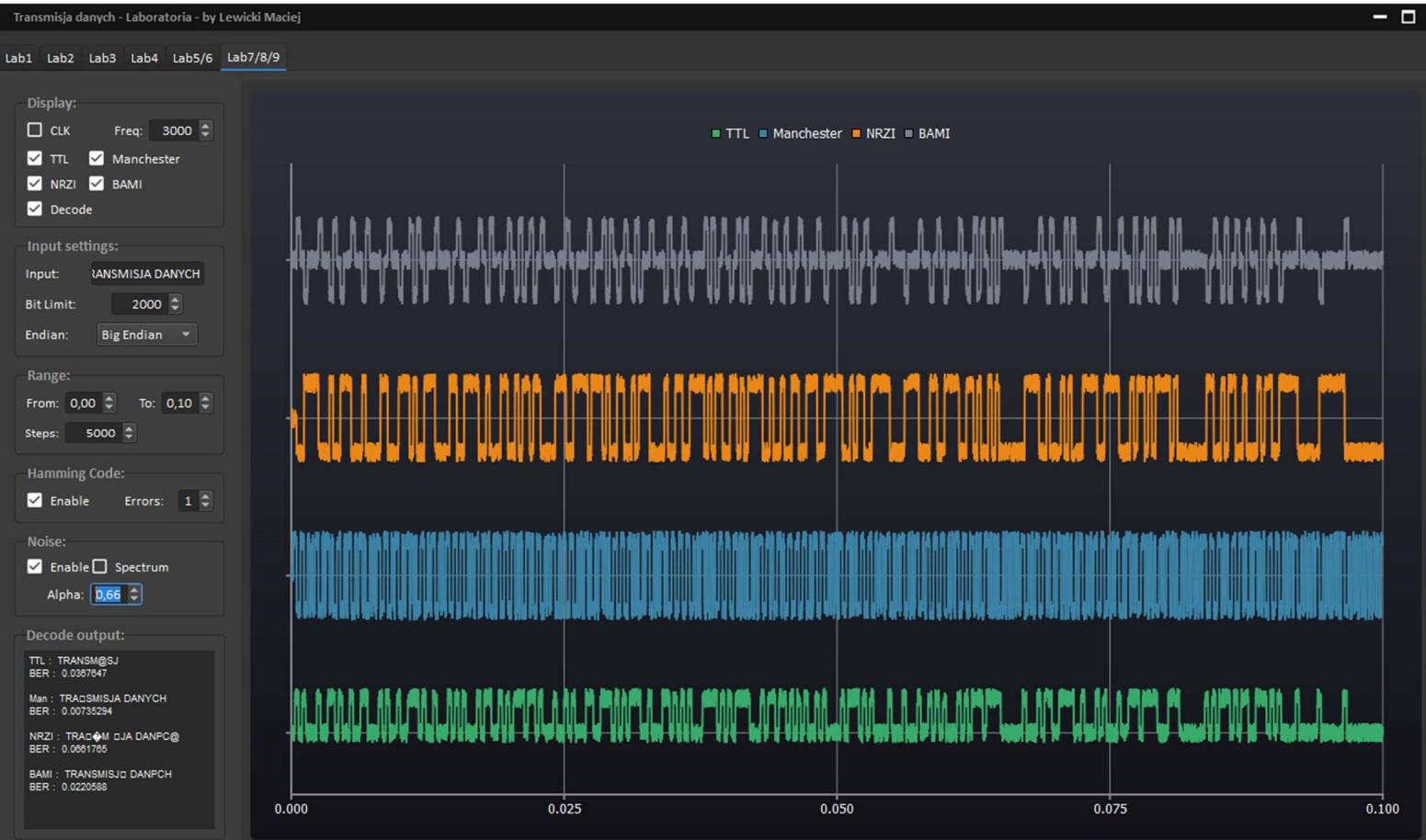
Spectrum BAMI



Spectrum NRZI



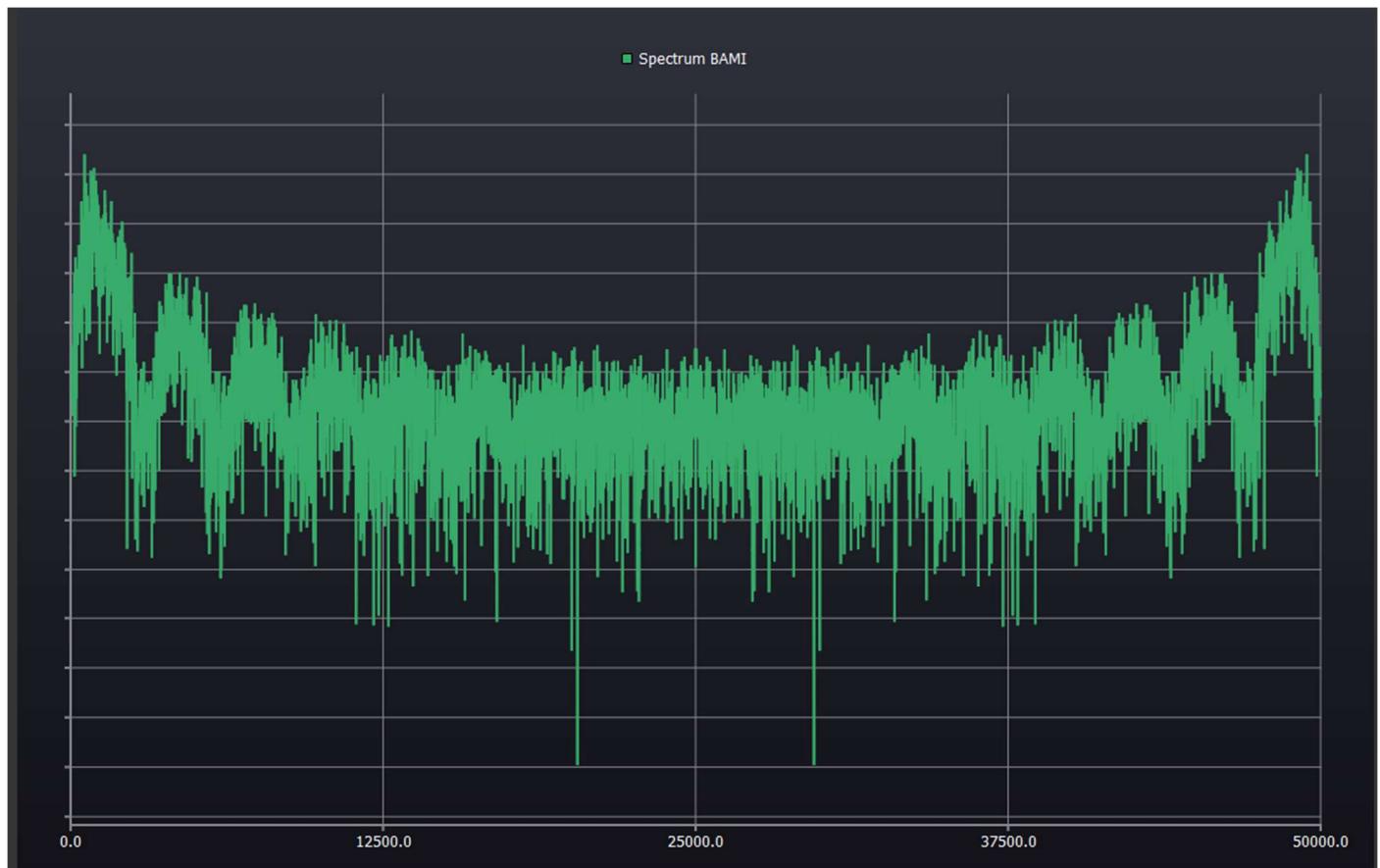
Wykres z szumem Alpha = 0.66:

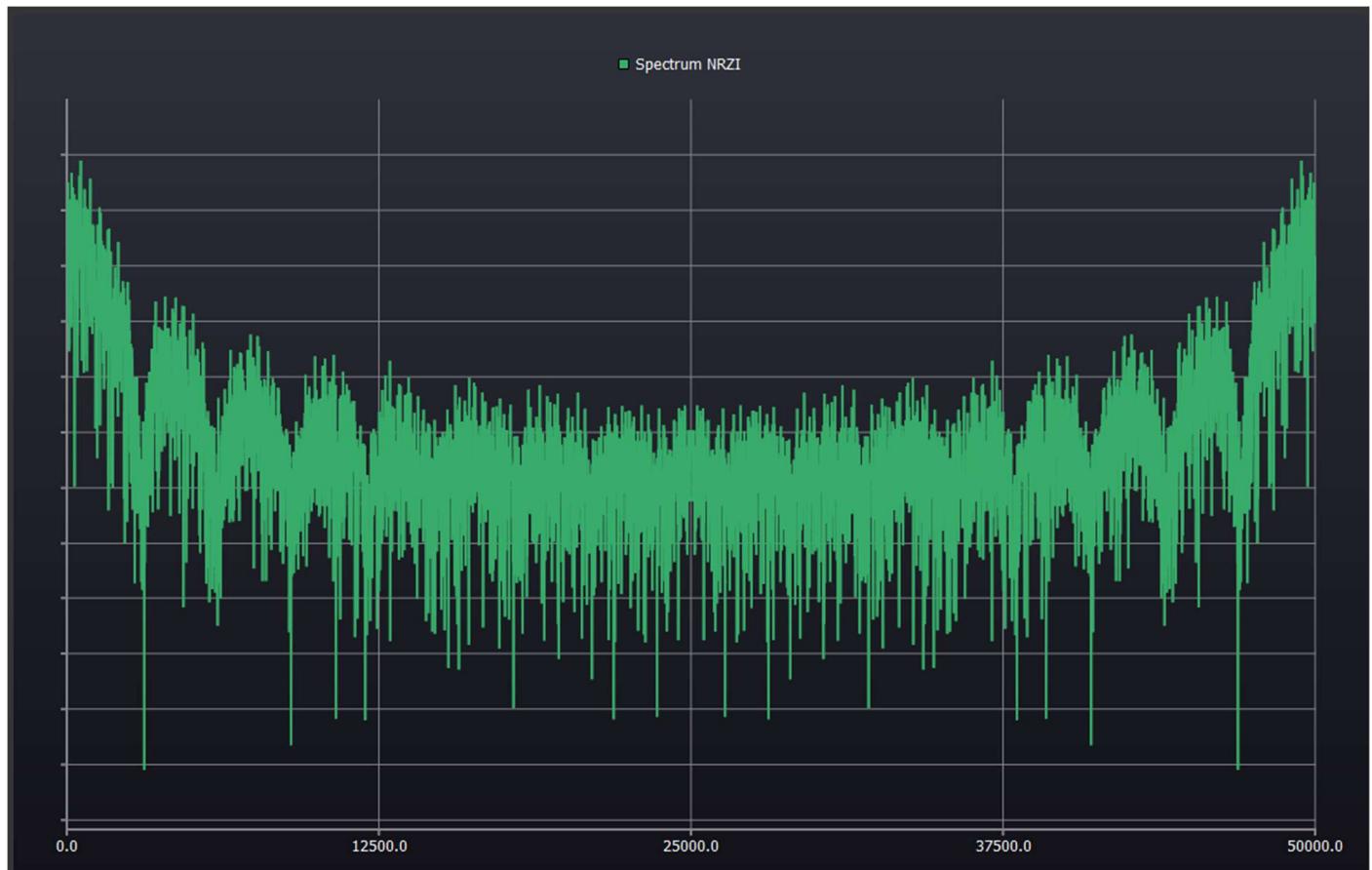


Tekst zdekodowany i wskaźnik BER:

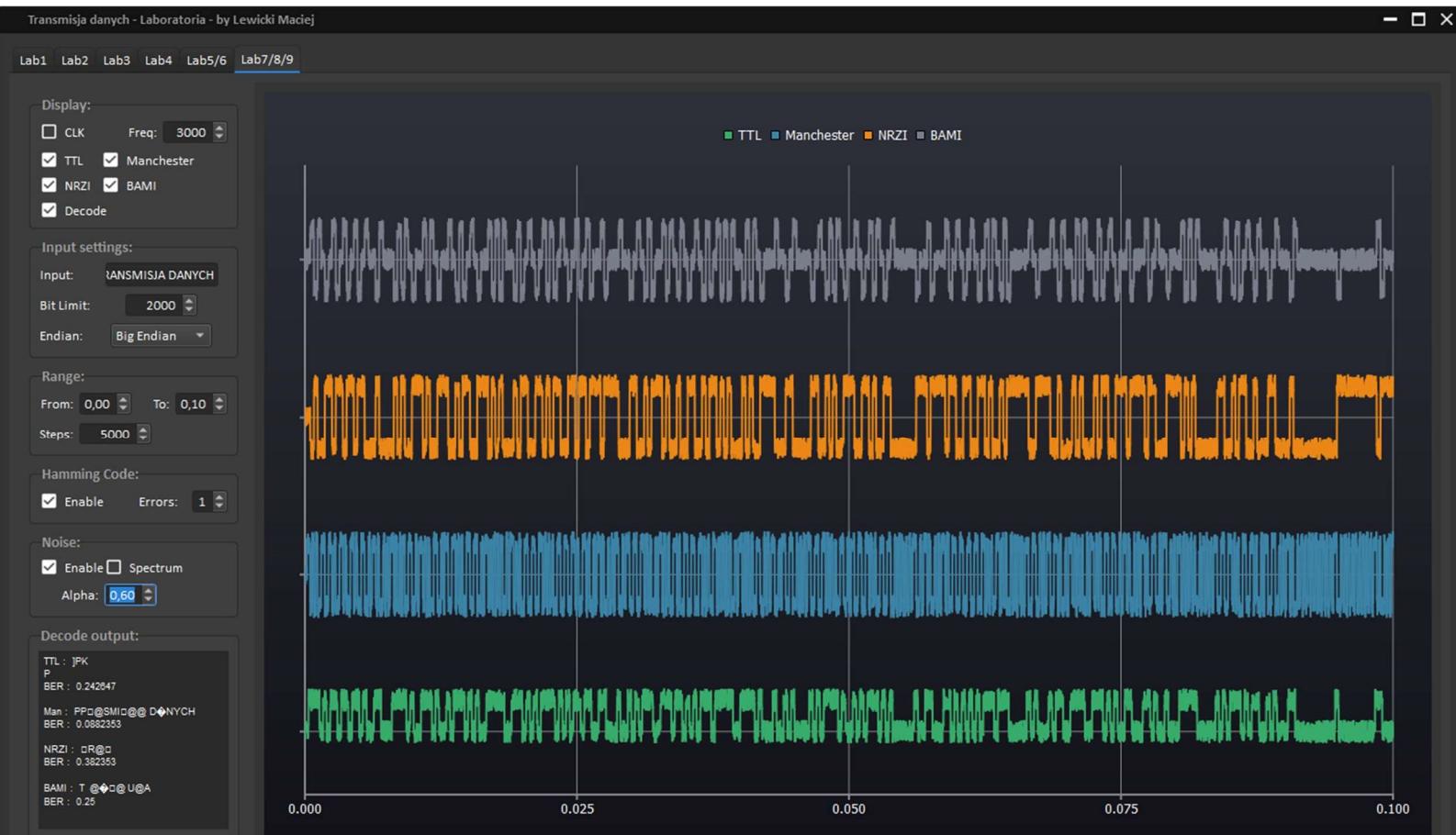


Wykresy widm z szumem Alpha = 0.66:





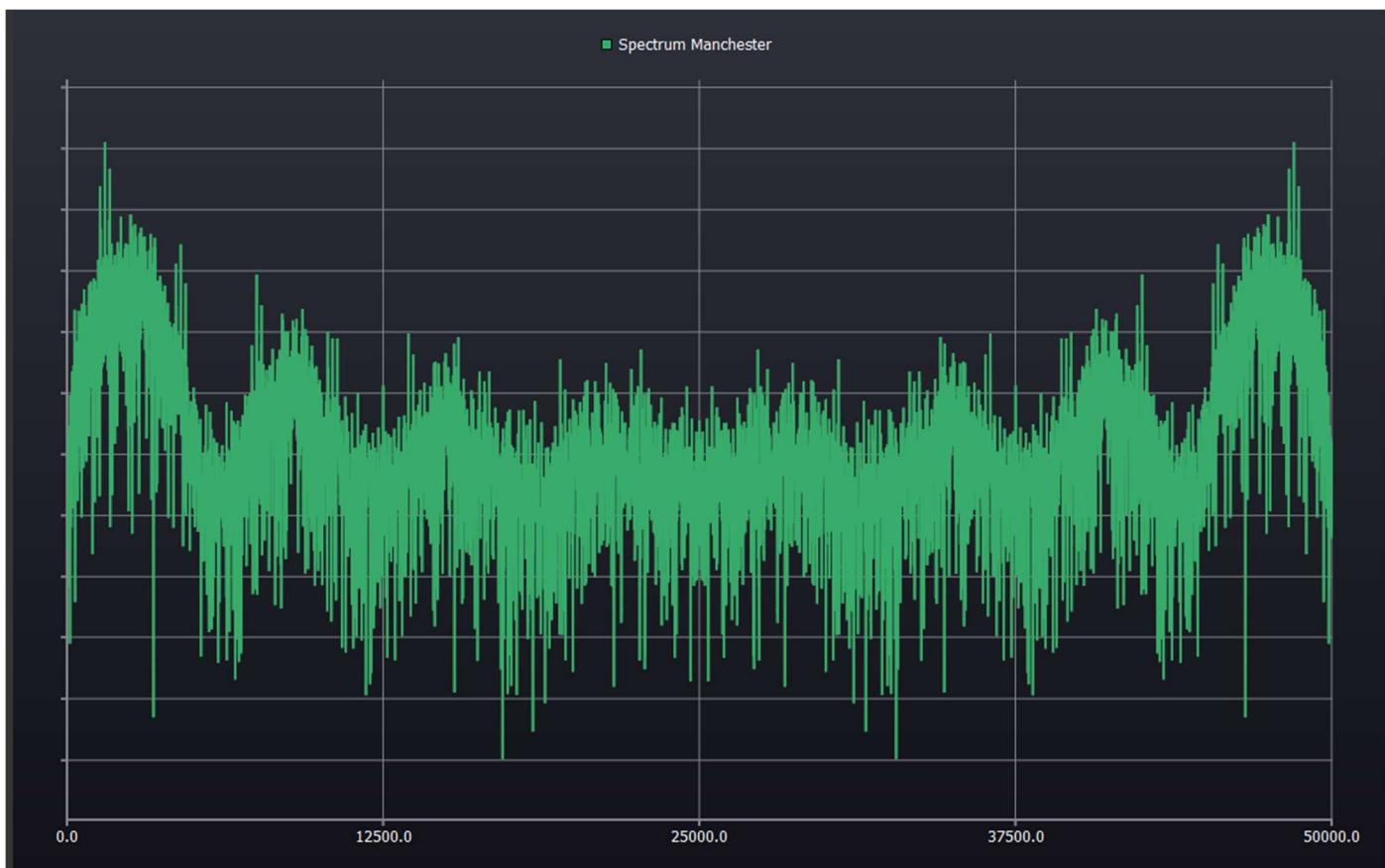
Wykres z szumem Alpha = 0.6:



Tekst zdekodowany i wskaźnik BER:

```
Decode output:  
  
TTL : JPK  
P  
BER : 0.242647  
  
Man : PP□@SMI□@@ D◆NYCH  
BER : 0.0882353  
  
NRZI : □R@□  
BER : 0.382353  
  
BAMI : T @◆□@U@A  
BER : 0.25
```

Wykresy widm z szumem Alpha = 0.6:

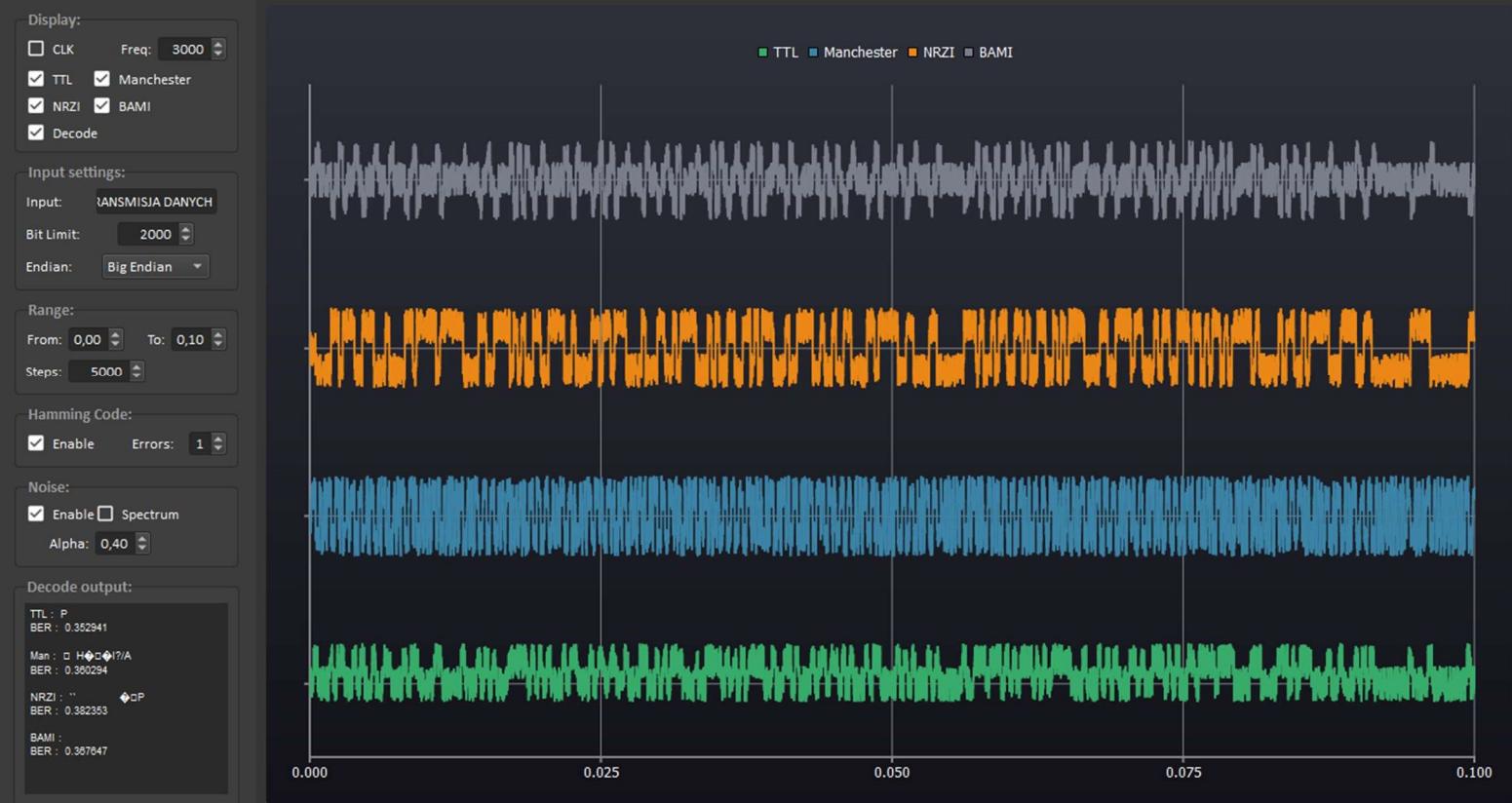




Wykres z szumem Alpha = 0.4:

Transmisja danych - Laboratoria - by Lewicki Maciej

Lab1 Lab2 Lab3 Lab4 Lab5/6 Lab7/8/9



Tekst zdekodowany i wskaźnik BER:

Decode output:

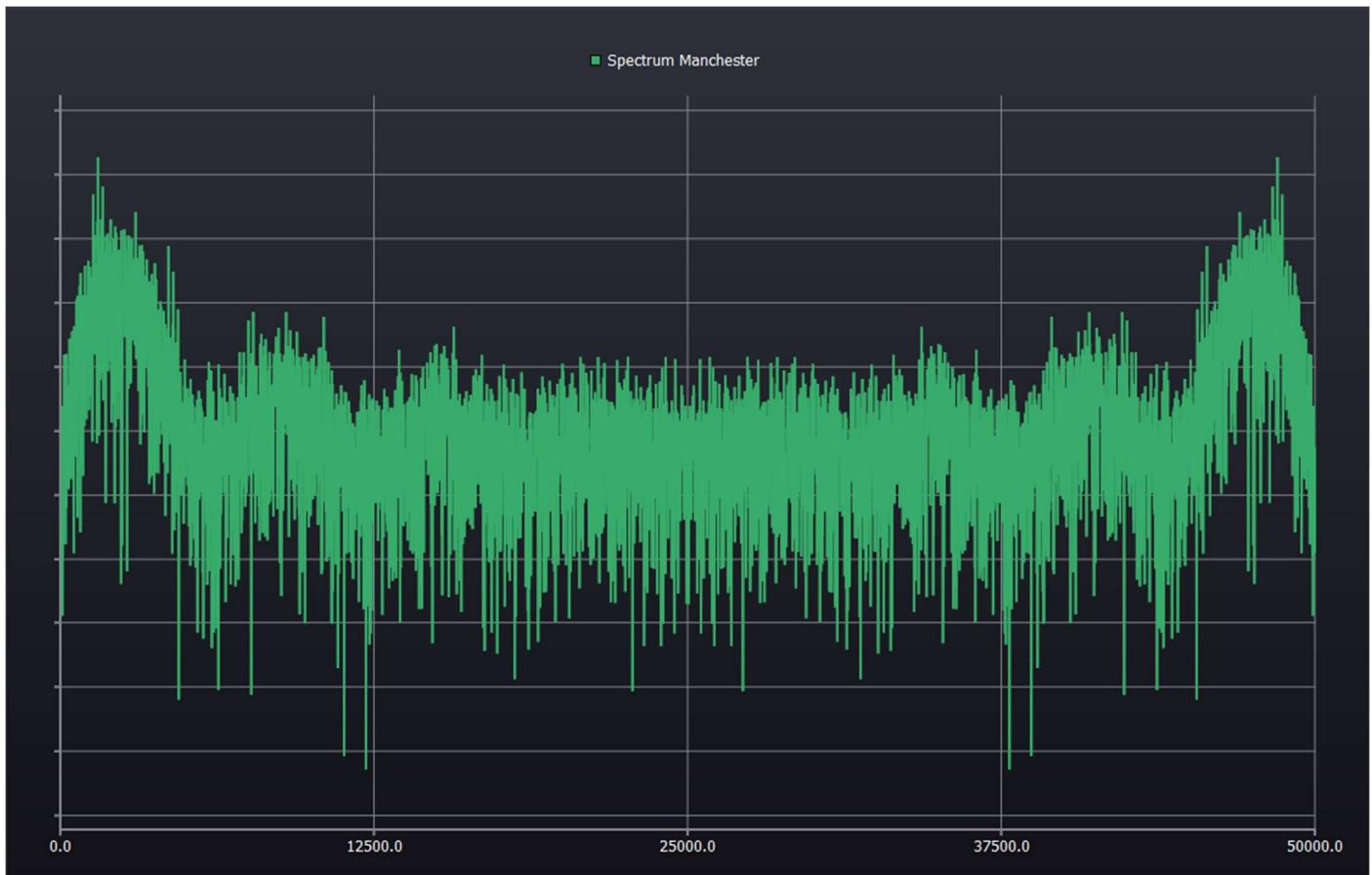
TTL : P
BER : 0.352941

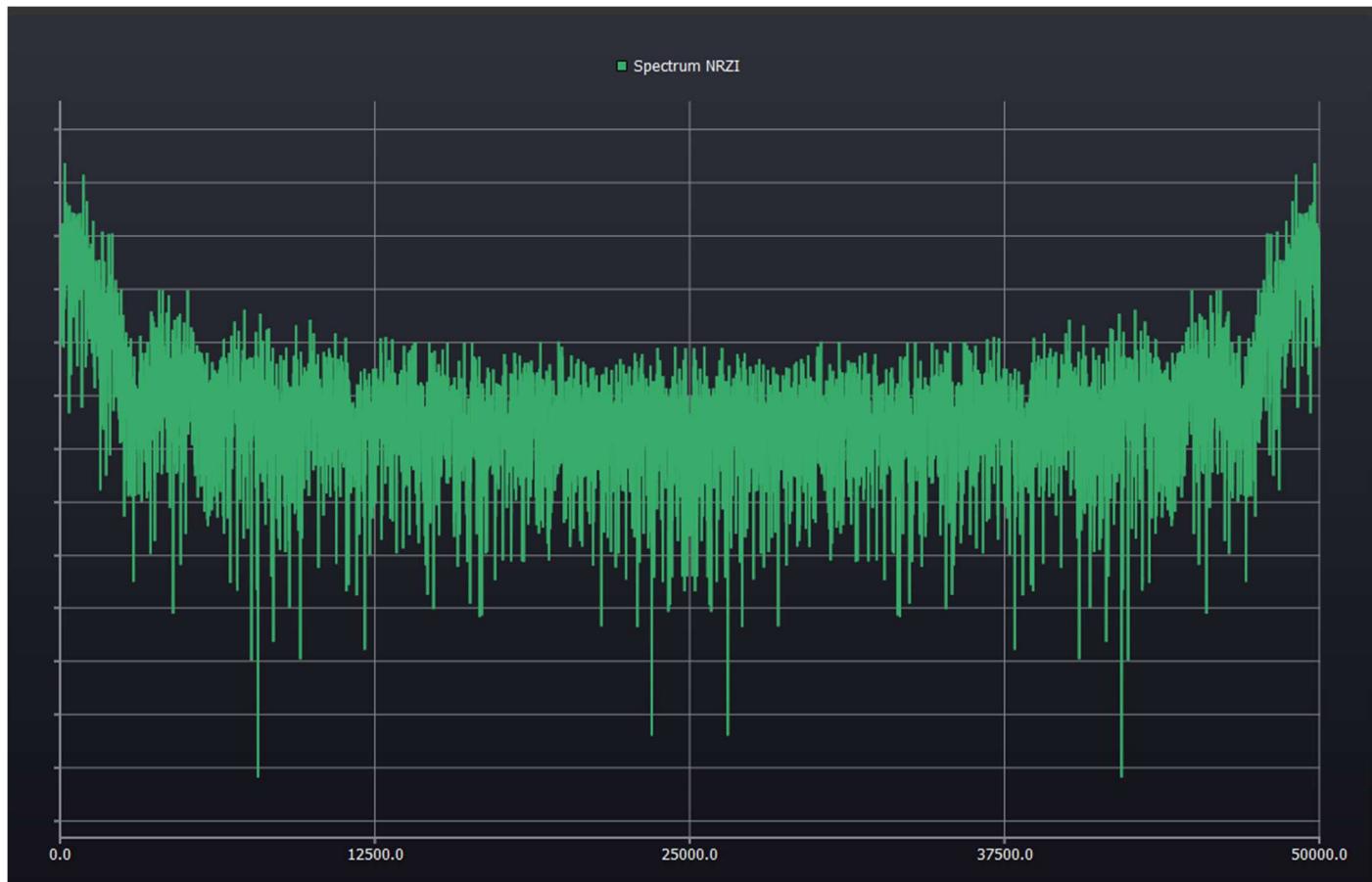
Man : H?D?I?/A
BER : 0.360294

NRZI : '' P
BER : 0.382353

BAMI :
BER : 0.367847

Wykresy widm z szumem Alpha = 0.4:





Kod szum:

```
LabSeries Lab7_8_9::addRandomNoise(LabSeries series, double alpha)
{
    for(int i=0; i<series.yVec.length(); i++)
    {
        double noise = QRandomGenerator::global()->generateDouble()-0.5;
        //((signal[n]*alfa)+(noise[nn]*(1.0-alfa))
        series.yVec[i] = series.yVec[i]*alpha + noise*(1-alpha);
    }
    return series;
}
```

Kod BER:

```
double Lab7_8_9::calcBER(QByteArray input, QByteArray output)
{
    output.resize(input.count());
    int errorCount = 0;
    for(int i=0; i<input.count()&&i<output.count();i++)
    {
        if(input.at(i)!=output.at(i))
            errorCount++;
    }
    return static_cast<double>(errorCount)/input.count();
}
```

