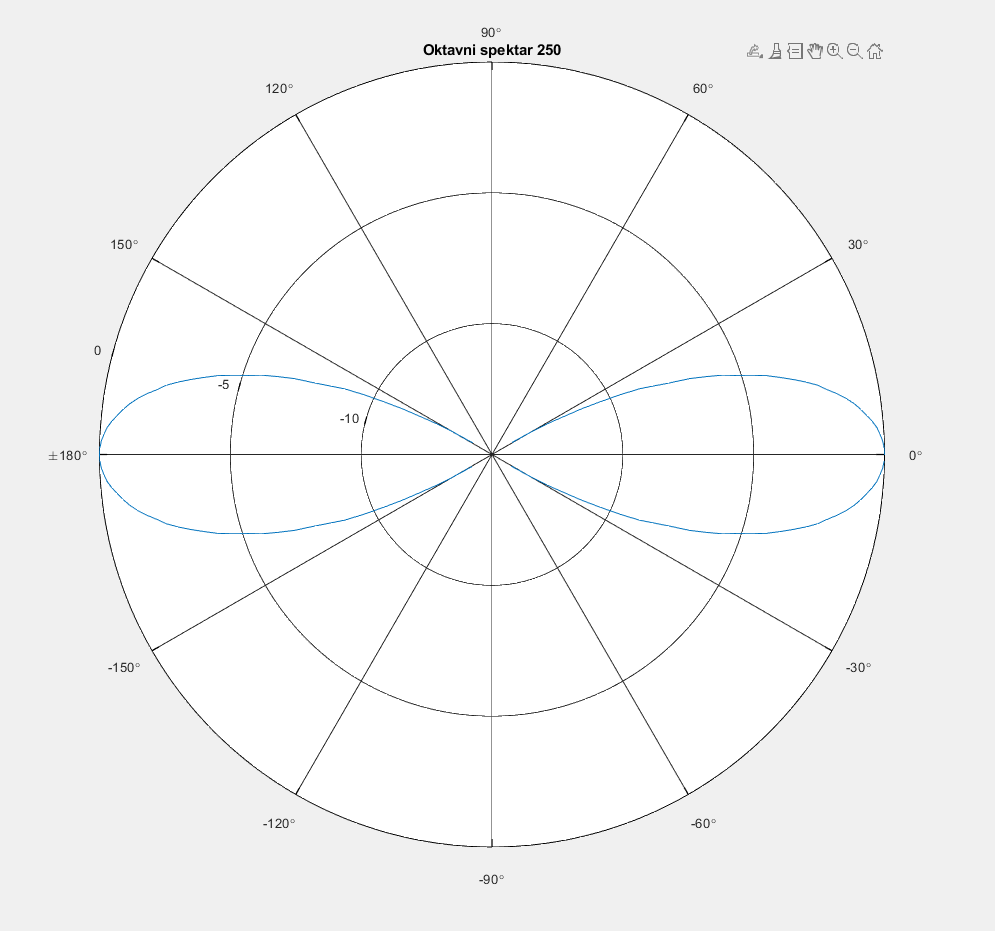
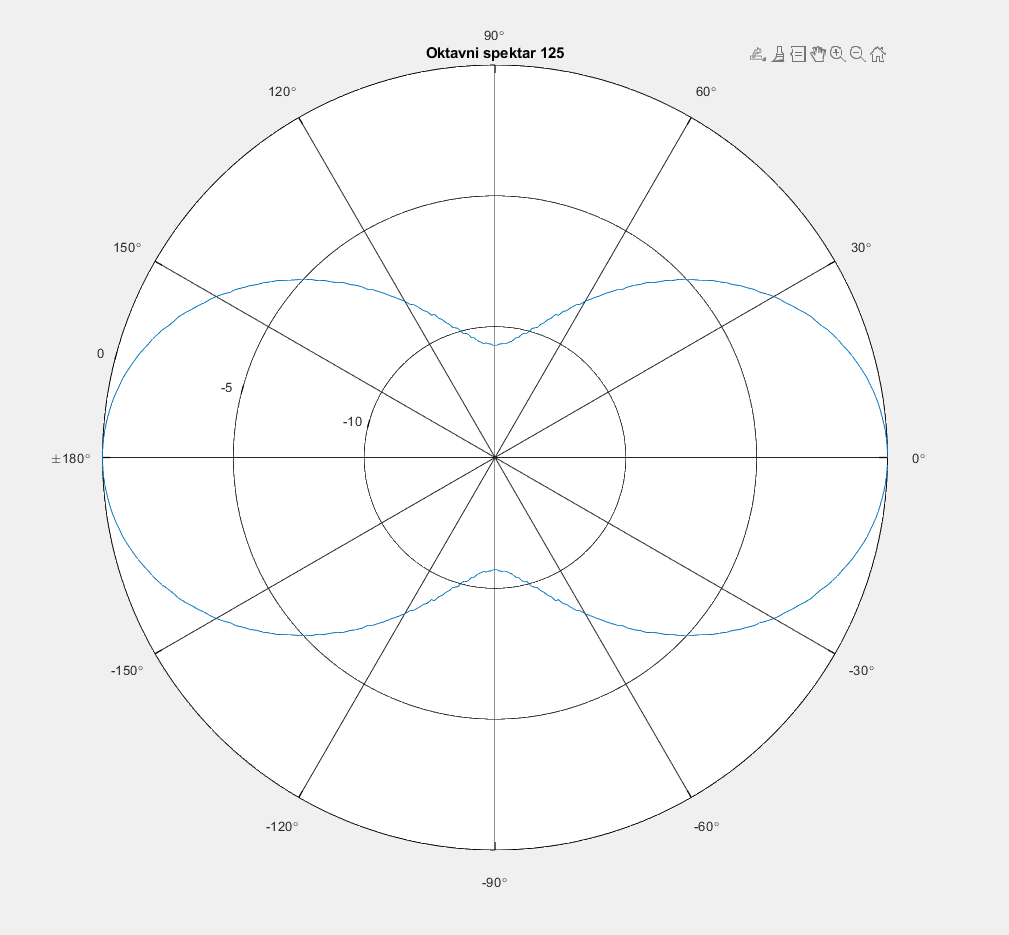
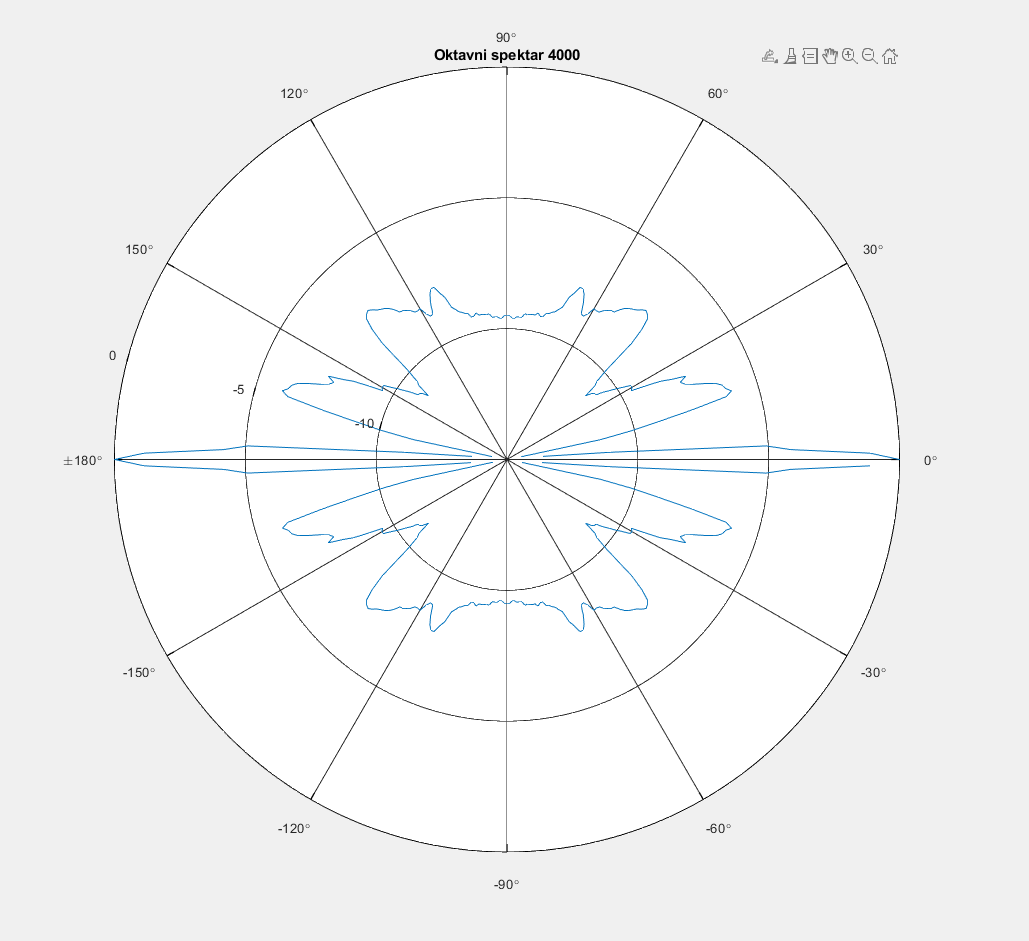
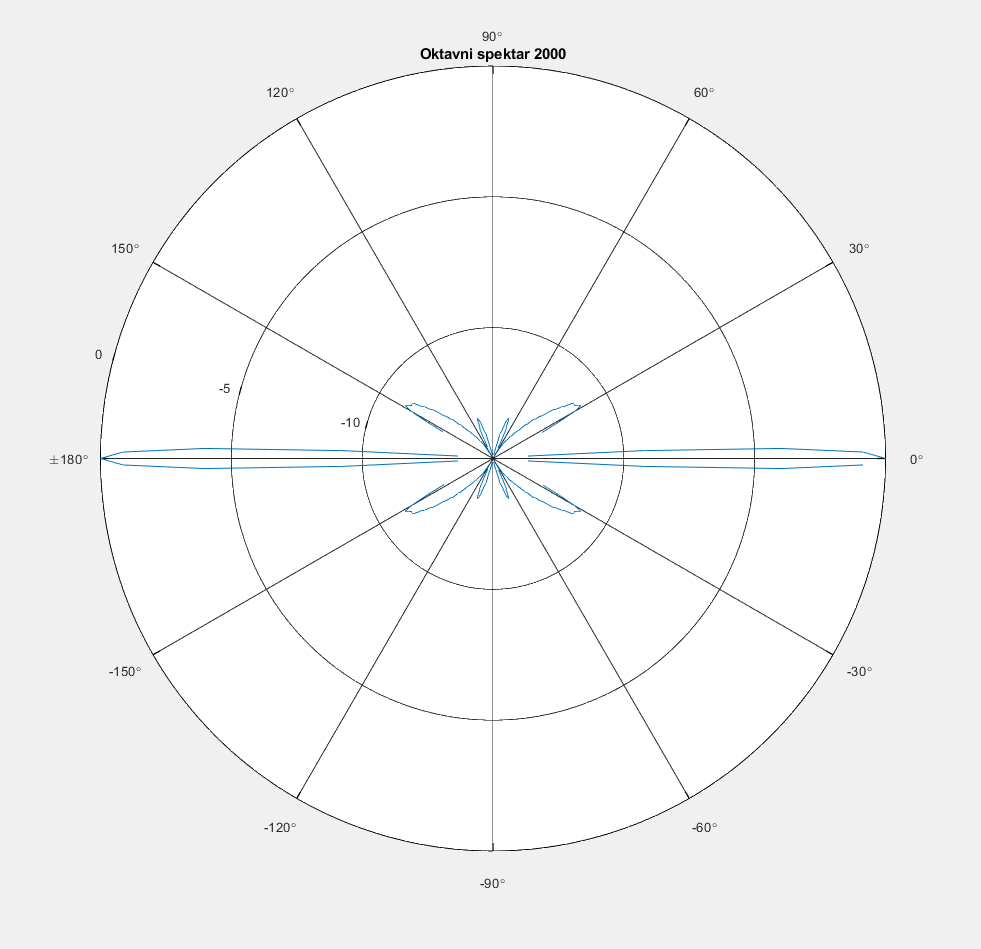
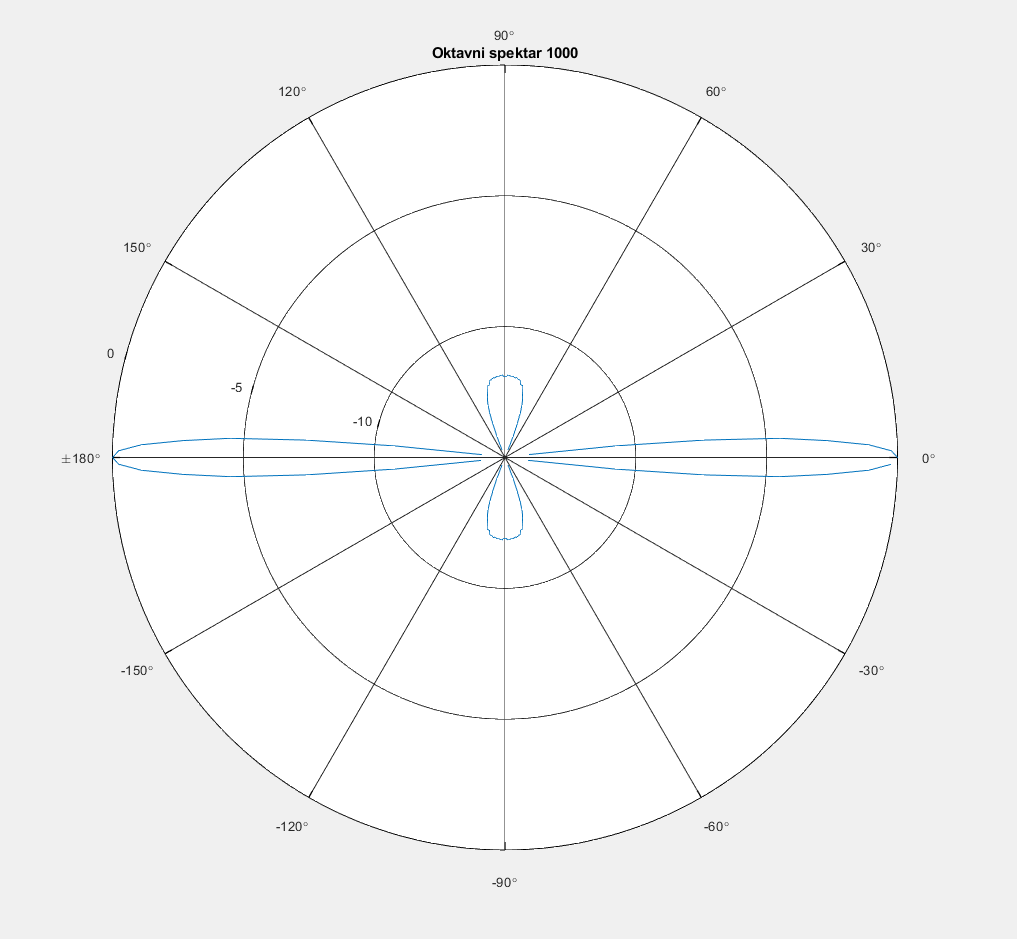
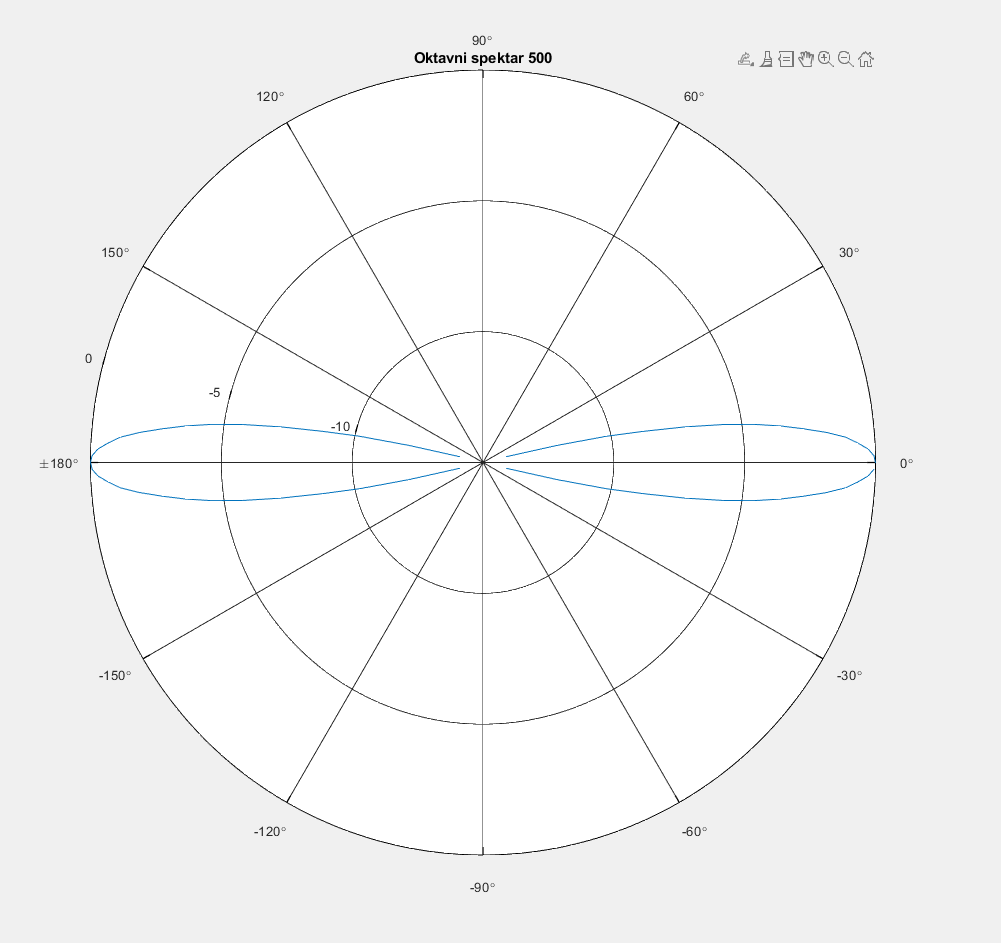
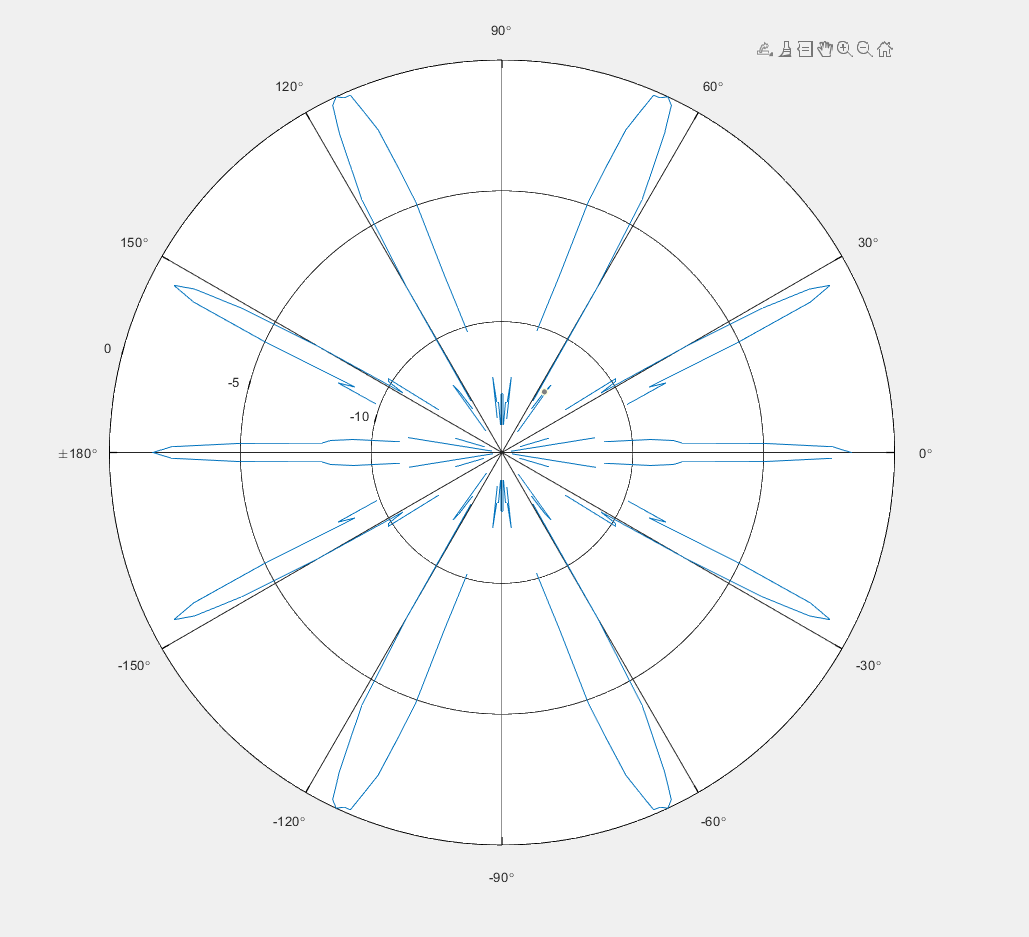
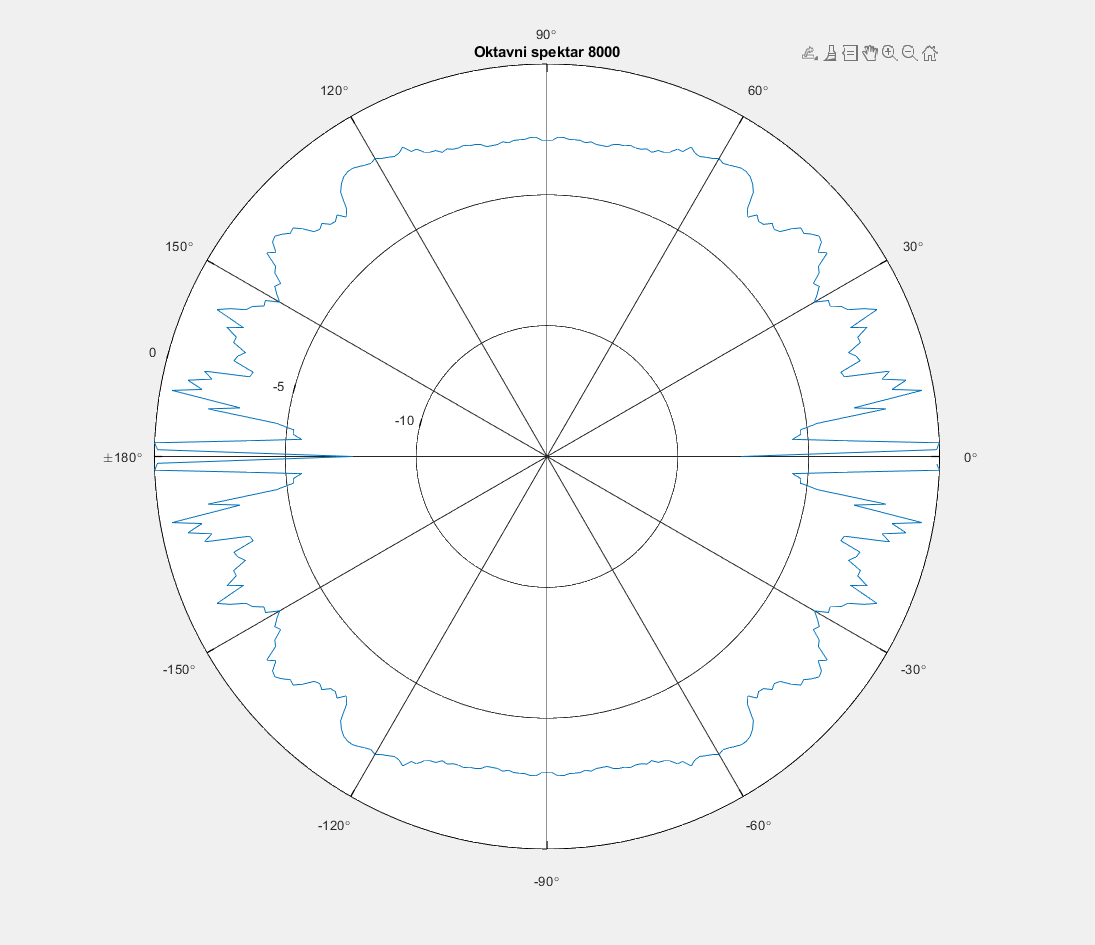
# Uros Stojanovic 0404/2019 DZ2 EA

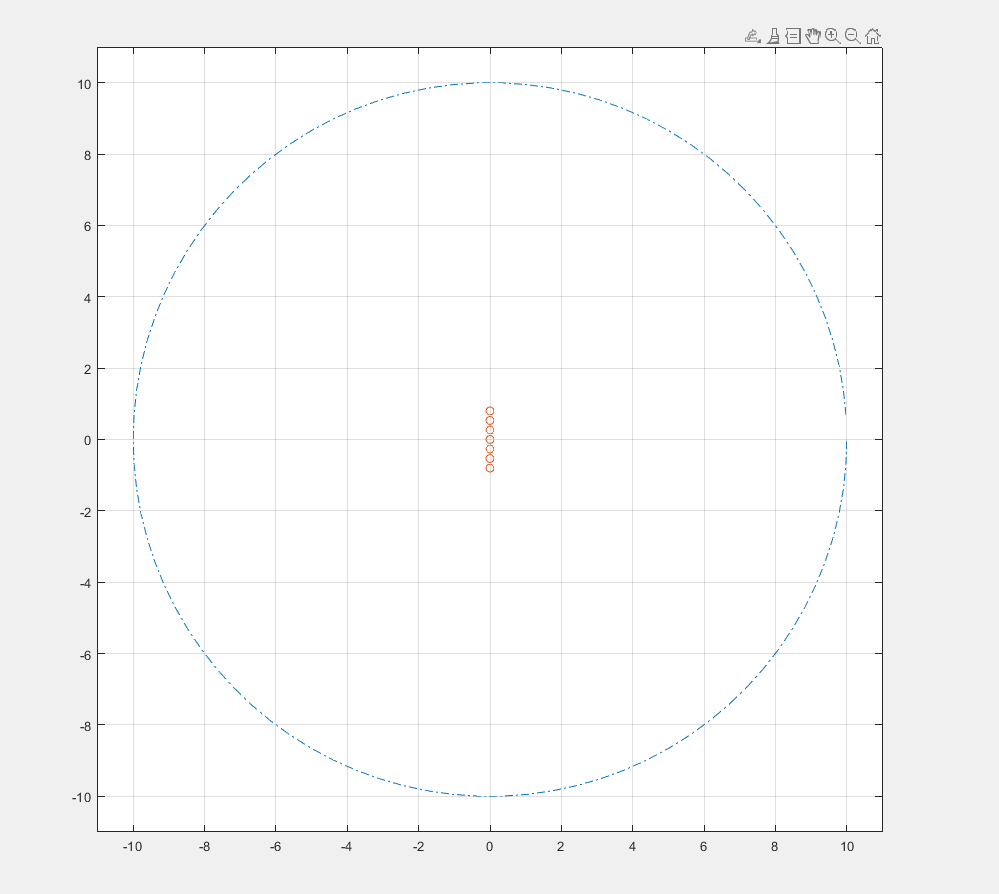
Slike usmerenosti za oktavne spektre 125Hz, 250Hz, 500Hz, 1kHz, 2kHz, 4kHz, 8kHz







Usmerenost na f=2825Hz



Izvori ( o ) i putanja po kojoj smo vrsili merenja ( -. )

## Poredjenje usmerenosti na f=2825Hz i na oktavnim spektrima sa centralnim frekvencama na 2kHz i 4kHz

Usmerenosti oktavnih spektara su usrednjene vrednosti za cele spektre i samim time dosta finije izoblicenije u odnosu na usmerenosti specificnih frekvenci. Frekvenca 2825Hz je tacno na prelazu iz jednog u drugi opseg(2kHz i 4kHz). Samim time izgleda donekle kao kombinacija te dve usmerenosti.

## KOD

clear all;

close all;

clc;

%% const

Pa=1;

r=10;

ro=1.206;

c=340;

fs=48000;

tau=round(r\*fs/c);

udeok=360;

x=zeros(udeok,2\*tau);

bbbb=404;

gggg=2019;

M=3+mod(bbbb,8);

D=2-mod(bbbb,10)/10;

if M==1

d=0;

else

d=D/(M-1);

end

%% tacka 5

t=2\*pi/90:2\*pi/90:2\*pi;

xizv=zeros(1,M);

yizv=(((1-M)/2):((M-1)/2))\*d;

figure, plot(10\*cos(t),10\*sin(t),"-.", xizv, yizv, "o"), grid on, xlim([-11 11]), ylim([-11 11]), axis square

%% tacka 3 i 6

U=1+mod(bbbb,4);

p=zeros(udeok,M);

Teta=0:(2\*pi/udeok):2\*pi\*(udeok-1)/udeok;

switch U

case 1

koef=ones(1,udeok);

case 2

koef=cos(Teta);

case 3

koef=(1+cos(Teta))/2;

case 4

koef=(1+3\*cos(Teta))/4;

end

f=gggg\*3-bbbb\*8;

%% tacka 7.1

flo = 88.388;

freq=[];

while flo<=12000

freq(end+1)=flo;

flo=flo\*2;

end

%% signaljenje

for i=1:udeok

for j=1:M

xkord=r\*cos(Teta(i));

ykord=r\*sin(Teta(i))-(j-(M+1)/2)\*d;

R=sqrt(xkord^2 + ykord^2);

x(i,round(R\*fs/c))=x(i,round(R\*fs/c))+sqrt(ro\*c\*Pa/(4\*pi))\*abs(koef(i)/R);

end

X(i,:)=fft(x(i,:));

end

%% tacka 7.2

figure, mmpolar(Teta,20\*log10(X(:,round(2\*f\*tau/fs))./max(abs(X(:,round(2\*f\*tau/fs))))),'TTickDelta',30','RLimit',[0 -15],'TLimit',[-pi pi]),hold on

%% oktavni spekt

Y=zeros(length(freq)-1,height(X));

for i=1:height(X)

for j=1:length(freq)-1

Y(j,i)= sum(abs(X(i,round(2\*freq(j)\*tau/fs):round(2\*freq(j+1)\*tau/fs))).^2);

end

end

for i=1:height(Y)

figure, mmpolar(Teta,20\*log10(Y(i,:)/max(abs(Y(i,:)))),'TTickDelta',30','RLimit',[0 -15],'TLimit',[-pi pi]), title("Oktavni spektar "+ num2str(125\*(2^(i-1)))),hold on

end