Heaven's Light is Our Guide

Rajshahi University of Engineering& Technology

Department of Electrical & Computer Engineering

Course No: ECE 4124
Course Name: Digital Signal Processing Sessional

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Experiment No: 07

Experiment Name:

Study of Z-Transformation & Plotting of Zeros-Poles for Non-Causal Signal

Theory:

A signal that is not cause-and-effect is called a non-causal signal. Therefore, according to the definition, a signal that occurs in both the past and the future is neither caused by its past nor affects its future, it is an uncaused signal. The sine and cosine signals are signals that are not caused by anything happening before them.

Code:

```
clc

x= [1 2 3 4 5 6 7 8];

pos = input('Enter the index of origin\n');
pos=pos-1;

syms z
y=0;
for i=1:length(x)
   y = y + x(i)*z^(pos);
   pos=pos-1;
end

disp('output of z-transform');
disp(y);

p = poles(y,z);

zplane([],p);
title('plot of causal signal');
```

Output

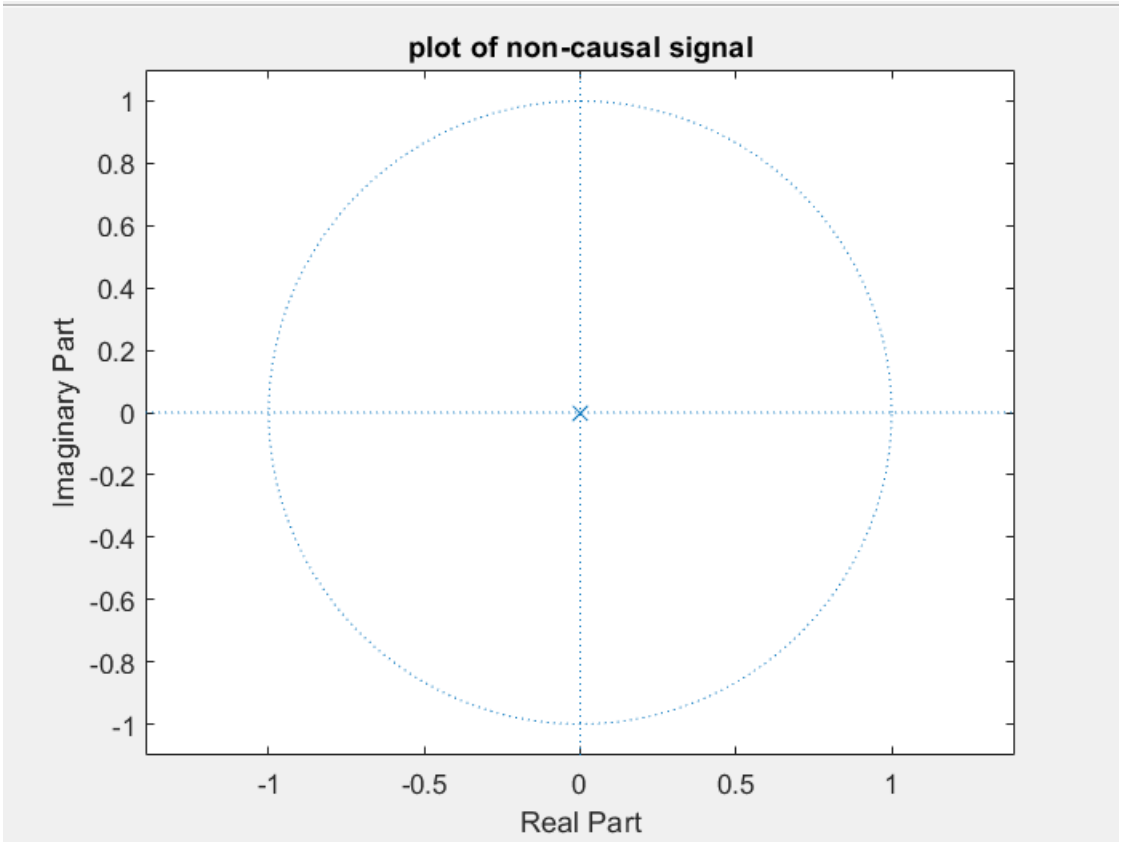

Fig. 1 Output of z-transform of signal

```
Enter the index of origin
5
output of z-transform
4*z + 6/z + 7/z^2 + 3*z^2 + 8/z^3 + 2*z^3 + z^4 + 5

fx >>
```

Fig. 2 Plot of zeros-poles for a non-causal signal

Discussion

In figure 1, we can see a common type of signal that doesn't depend on cause and effect. This equation only has one value that is zero and no other value. The worth of the pole is shown in figure 2.

Conclusion

In this experiment, I learned about z-transform, how to find zeros and poles, and how to plot them using matlab.