Table of Contents

Title:Control System-Second Order System: diagonal shifting

```
%Author:ShivaKumar Naga Vankadhara
%PS No:99003727
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%Version:1.0
```
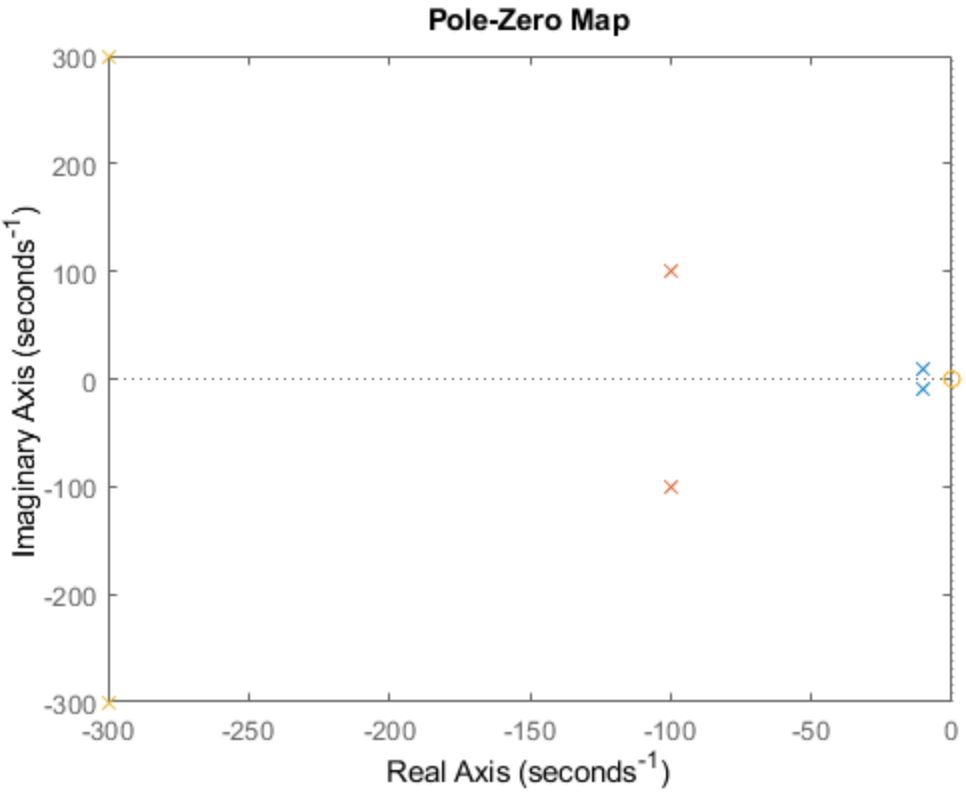

This Document has movement of poles for Second Order System

```
zeros = 0;
poles = [-10+10i -10-10i];
gain = 1;
sys = zpk(zeros,poles,gain);
hold on
pzmap(sys)
[wn1,zeta1]=damp(sys)

zeros = 0;
poles = [-100+100i -100-100i];
gain = 1;
sys = zpk(zeros,poles,gain);
hold on
pzmap(sys)
[wn2,zeta2]=damp(sys)

zeros = 0;
poles = [-300+300i -300-300i];
gain = 1;
sys = zpk(zeros,poles,gain);
pzmap(sys)
[wn3,zeta3]=damp(sys)
```

```
wn1 =

   14.1421
   14.1421


zeta1 =
```

```
    0.7071
    0.7071


wn2 =

  141.4214
  141.4214


zeta2 =

    0.7071
    0.7071


wn3 =

  424.2641
  424.2641


zeta3 =

    0.7071
    0.7071
```



Analysis of movement of poles in the diagonal Direction.

1. Overshoot remains same at the different location of poles. 2. Frequency gets increased when the pole is moved upwards. 3. Frequency gets decreased when the pole moves downwards. 4. As the zeta is in between [0-1] the poles are complex conjugate roots.

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