Table of Contents

Title:Control System-Second Order System:vertical shifting

```
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%Version:1.7
```

This Document has movement of poles for Second Order System

```
zeros = 0;
poles = [-10+20i -10-20i];
gain = 1;
sys1 = zpk(zeros,poles,gain);
hold on
pzmap(sys1)
[wn,zeta]=damp(sys1)

zeros = 0;
poles = [-10+10i -10-10i];
gain = 1;
sys2 = zpk(zeros,poles,gain);
hold on
pzmap(sys2)
[wn,zeta]=damp(sys2)

zeros = 0;
poles = [-10+30i -10-30i];
gain = 1;
sys3 = zpk(zeros,poles,gain);
pzmap(sys3)
[wn,zeta]=damp(sys3)


wn =

    22.3607
    22.3607


zeta =
```

```
    0.4472
    0.4472


wn =

   14.1421
   14.1421


zeta =

    0.7071
    0.7071


wn =

   31.6228
   31.6228


zeta =

    0.3162
    0.3162
```
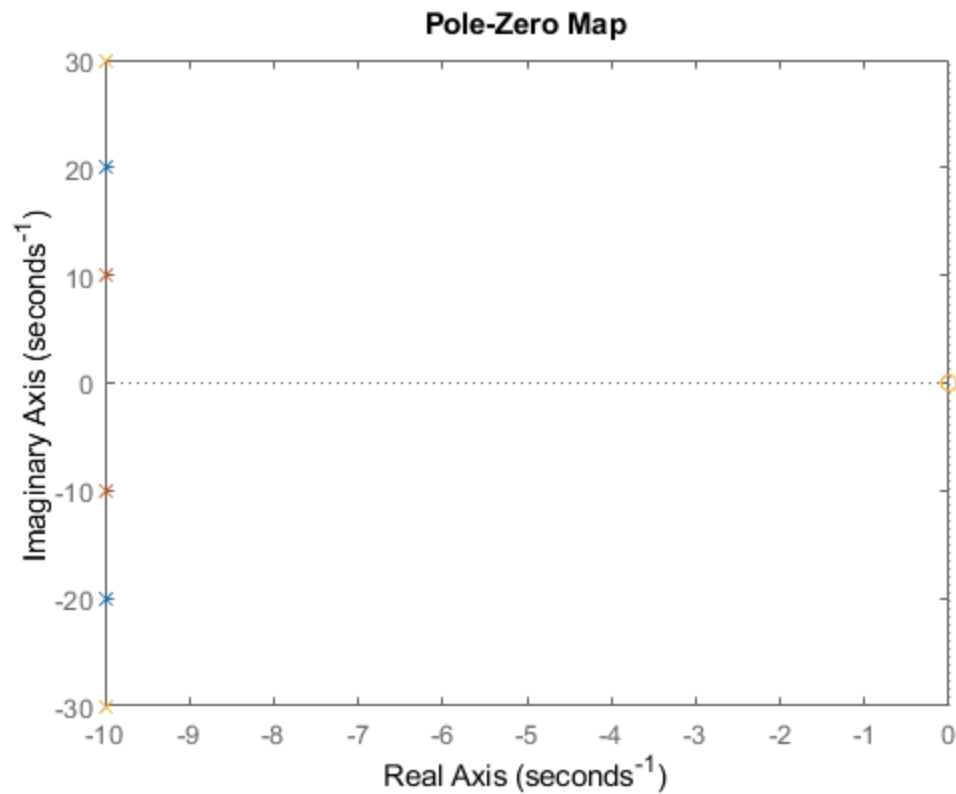
Pole-Zero Map

Analysis of vertical movement of poles:

1.for the upward movement of the pole Overshoot increases, frequency increases , Damping gets reduced so the system is becoming stable when it is moving upward. 2.So for the Downward movement of the pole Overshoot decreases, frequency decreases, Damping gets increased so thr system is getting less stable.

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