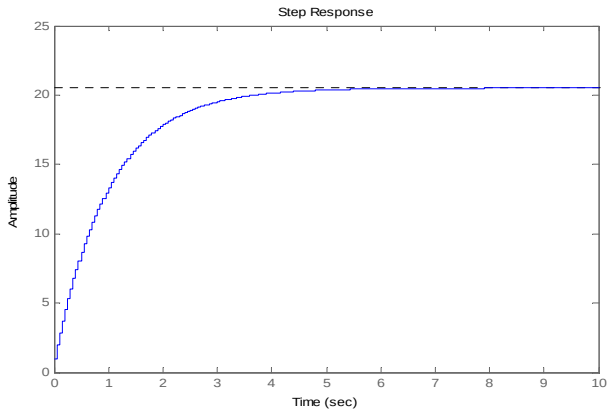
hier findest du näheres
http://public.tfh-berlin.de/~reck/Elektronische%20Messtechnik%204.pdf Ab Seite 77

Impulsinvarianz

$H(s) = \frac{1}{1+sRC}$ → $h(t) = \frac{1}{RC} e^{\frac{-1}{RC}Ts}$ → Z Transformation $\frac{1}{RC}\sum_{n=0}^{\infty} e^{\frac{-1}{RC}nTs} z^{-n}$ = mit RC=1s, Ts=0.05s

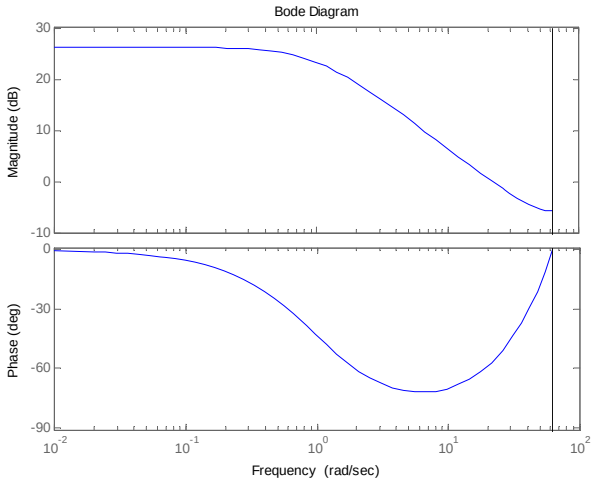
$H(z) = \frac{1}{1-e^{-0.05}z^{-1}}$ mit

```
a=[1 -exp(-0.05)]
b=[1 0]
sys=tf(b,a,0.05)
step(sys,0:0.05:10)  ; Sprungantwort
```



Bodediagramm

dbode(b,a,0.05)

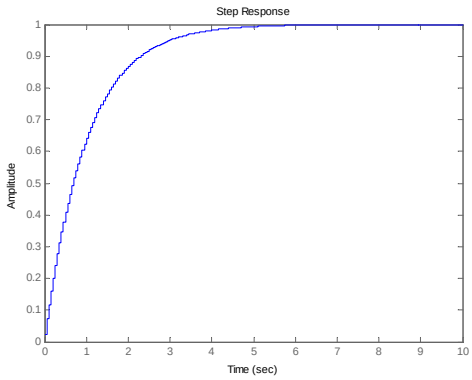


Bilineare Transformation

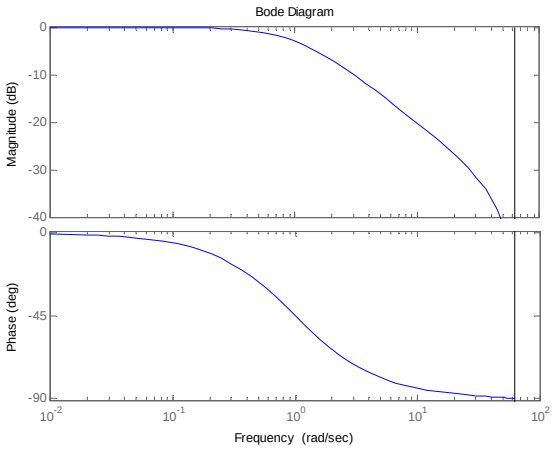
Mit $s = \frac{1}{\tan(\pi fg / fs)} \frac{z-1}{z+1}$ in $H(s) = \frac{1}{1+sRC} \rightarrow \frac{zv+v}{z(v+1)+v-1}$, v=tan(0.05/2)=0.025

a=[0.025 0.025]
b=[1.025 (-1+0.025)]
sy=tf(a,b,0.05)
step(sy,0:0.05:10)

Sprungfunktion:



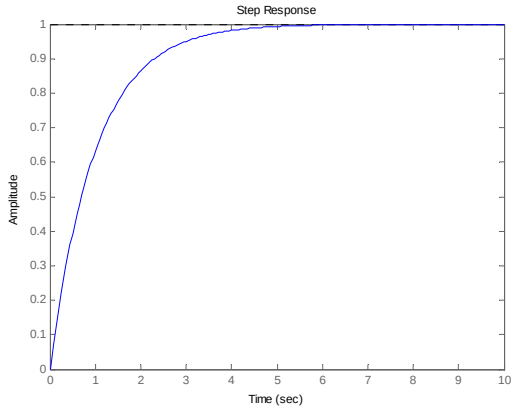
Bodediagramm:
dbode(a,b,0.05)



Kontinuierliches Modell:

Sprungantwort:

a=[1]
b=[1 1]
sy=tf(a,b)
step(sy,0:0.05:10)



Bodediagramm:

```
a=[1]
b=[1 1]
bode(a,b)
```