



消事大学

Tsinghua University

T4.
(1)
当W=0時 Golju)= 102-180.
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令S=をeio, を>0. 当SHOT到O+时. BH90·>0·→90:

闭环系统稳定

机场农力

数格生标图为一

(2) & W=01

T5.

- 11) W=D时. Goljo)= KZO*
 W=00 时. Goljo)= KZO*
 对应图は (a) 两次包括(-1,0) 故不稳定
- (2) W=0时 Goljo) = 10 Z-90 W=10时 Goljo) = 0 Z-270 对应图(b) 不包括(-1,0) 故稿版
- (3) W=O时 Goljo)= W Z-180 W=w时 Goljw)= O Z-270 对应图(d) 日两次包括(-1,0) 故不稳定
- (4) W=0时 Go(jo)=-KZ-180° W=の时 Go(jo)= 0 Z-go 対应目(e) -次 M= N+n=-1+1=0. 故稿定.

- (5) W= O財 G,1jの)= ロZ-270 W= い时 G,1jの) = ロZ-180 対応目(f) m= N+n= 1+1= 2, 故不稳定.
- (6) W=0时 Goljo)= 10 Z-270° W=10时 Golju)= 0 Z-95 对应图 (c) m=1N+n=1+1=2. 效不稳定

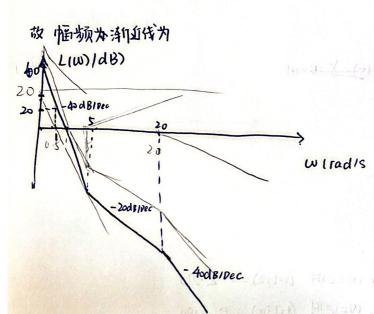
T6.

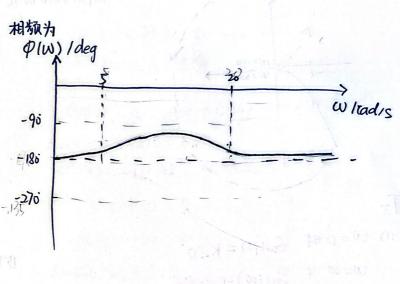
- (a) M=N+n=1+1=2,不移稳定
- (b) m=N+N=-2+2=0. 稳定
- (C) M=N+N=-2+2=0, 稳定
- d) m=N+n=-1+1=0. 稳定

1 201g10 = 20

LK = 0°

- $\Im \frac{1}{S}$: -201gW, $\phi = -90^\circ$
- (3) $\frac{1}{0.055+1} = W \le 20$, L(W) = 0. $\phi = 0$ W > 7 > 20, L(W) = -20 IgWT, $\phi = -90$ $W = \frac{1}{20}$, L(W) = -3 dB. $\phi = -45$
 - @ 0.28+1: W = 5. W>25. LIW1= 2019WT





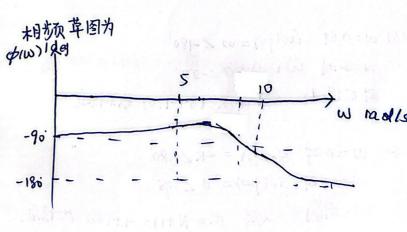
(6) 0 201975 ≈ 375 × K=0: 201975 ≈ -2.5 . ∠K=0

Ø €: -201gW. Ø=-90.

3 0.25+1: W=5.

 $\bigoplus_{S^2 + 16 + 100} 1 \longrightarrow \frac{1}{100}$ $\frac{1}{S^2 + 16 + 100} \Rightarrow \frac{1}{100} S^2 + \frac{4}{25} S + 1 , W = 10.$

L(w) | plB 17.5 -20d B|dec -25 - w|rad/s -40d B /dec





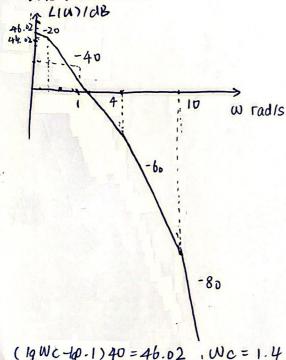
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T8 (4)

(4) 0 & 20/920 = 26.02

@ W1= 10, W2=4. W3=10

故临频渐近线为



(19Wc-10-1)40=46.02 , WC=1.4

相角裕莹

T10. (a) $T_1 = \frac{1}{0.5} = 2$. $T_2 = \frac{1}{10} = 0.1$

= W= 0.

20 x 11qu-5-1gu-1) = +20 = 33.98 dB.

K-

2019K= 33.98-20=13.98 35 效*开环传递函数为 <u>S</u> S 12S+1) 10·1S+1)

Ø1W) = -90- arctan 12W) - arctan 10.1W)

MC= U.5 × NTO = 1.58

φ(Wc)= -171.42, 故稳定, V=Q(Wc)+180

(d) $T_1 = \frac{1}{1} = 1$. $T_2 = \frac{1}{2.5} = 0.4 = 8.52$ °

20 1g K= 20. K=10

放析环传递函数为 10(St1) S10.1652+0.85+1)

&ca) (191Wc) - 192.5) 40 = 20 IWC = 7.9

(Plwc) = -90 + arctanlw) - 2 arctanlo.4w) = - 152.09.

V= 61W0>+180=27.91,故稳定

\$(W) = -90 - arctan (10Wc) - arctan (0.25Wc) - arctan 10.1Wc) = -283.17

r = \$1Wc) +180 = -23.17

\$1wg) = -90 - arctan (10wg) - arctan (0. 25wg) - arctan (0. 1 wg) = -180, wg = 0.54 幅值裕量 Kg = -40/191.4-190.54) = - 16.55 dB

故系统不稳定

T9.

(1) phyone -goi-arotanthwater

タ(W)= go-arctan (TIW)-arctan (Tzw) 単減. 当K帕大时,Wc 埔大,故 Ø(W) 减小

(2) 如w)=-180 + arctan (Tw) 单值. 当K帕大时、Wc帕大,故夕(We) 幅大