

JYScãÑÑ s ys-VÑÓ yÓ ÓÑÑ SéÑÑ Ó ú ½ ý #

!æ!A Âlè 2(4 L<3ì T7 \$í \ Õ g)3-A/£

9Æ^{BMO} w{ !OËİ ß wBç7«t wa ÇJ8^BwKuf A-xw0 "- L "

æßŽ-D GT " Ö È ; 6*#½" K•" K,>->-¶ œ®! !®+ 0Ž Ù Õ È g Ý-A/£ m" D Ù œ®!!®+ ö
Ç Ž * 7f7c G2(4 /8-A/£K•" D Ù œ®!! x+ xŽ-¶ ÑEGT " *b } ; œ /8 " K•" K,>->-¶ œ®! !x f-
Ç ž-D GT " 7W " K•" K,>->-¶ œ®! !® ø

...œ>@ÆA Âlè 2(4] CF • Õæ@B pL<3ì T7 \$í \ Õ lè Sù#p\ Õ g , w /ø³ lè x
; Õ- K!+±L<3ì T • Õš- N, ÷lè 2(4 ù7 *^ ÓKóZ ĭ • N, NÄN ý ' ³ lè 2(4 ±0v uKh
i š- TM< 1, %& » =Žz4)+±6*FüTM< w .g³ 0v uKhi š- &\$í plè Sù#p\ Õ mB±±%*Uw
2O³ p*LSù#p\ Õ #lè 2(4 6*Fü± C>ñ, w8 ½³ lè 2(4 +±L<3ì T7 \$í \ Õ g)3 , ,L4 É
=•; wUL<3ì T • Õ±±%*U8 wè 2(4 ' (ÝBLKhi wv uKhi š- &2(4 ‡ • Ì w(4 ù C*y e c \
Õ6*Füwa | ³ 2(4 =Ž%æf Ç T lè xDTLÉLúNµ%*UA076*FüDÀ' -lè 2(4 4! . : =• ü±±.
4 \ Õ wü W\ Õ • L² 2(4 DÀ' ±6*Füw » 2(4 5D• ±6*Fü lè xDTLÉL\ r D° < #6*FüÉ Í wTEL
\ r D° T #6*Füü > wAlè 2(4 e c+±6*Füh>®TMCg2(4 ±±ì 6*

œl[œ@ÚÈ 2(4 Sù#p\ Õ 0v uKhi š- L<3ì T7 \$í \ Õ 6*Fü
Z + 31" \$ Á 6 0œœœ' ([4 - . Äöœœœ' 0 4C\$ Á! !!K® %ø! B o! xK !OK®

œœ> L<3ì T \ Õ)3 @ç' É øDTMg Ý2(4] C
F • Õ "æ@B p : / Ç+±L<3ì T7 \$í \ Õ ^{BO}%Á
*U »!æA Âlè ĭ ±lè 2(4 " < » - . ù' . +±øDTM
g Ý %lè 2(4 h>®2 MÖž&è 1 Â Âlè x3ñ
5 %&w] d• U] &f" >@œ 0v %K¼mlè Â# Ó
É ĭ "lè Dè] p1 Alè WWL/ <") 7!lè
GÓ2(• 8Kz%>@®%2 Xlè x dTMÖ Fü< "lè x
] L<3ì T • Õ %*U "æ@Ô*LSù#p\ Õ %lè Sù
#p\ Õ h>®(Ý g "MÖDTEL< r Ó" Õ "lè xDTLÉL
œUŠ çp Õ çUŠ | Ñ, ' (Ý ⁰⁰%>ç w^ó ý ' "lè
Sù#p\ Õ \ *^lè x 1 Õ- K!+±L<3ì T • Õ B p+±7
\$í \ Õ %lè x 1 Õ- K!+±L<3ì T • Õ š- %wœ@
• ç &w >oh>®2 lè x-a-> Õ- #±±—4 Á É
%š- o' lè x ; Õ- K!+±- š- x⁰%
lè 2(4 ±±! %æ U » " 6MÖžÖš- 1
OžÖDTEL "x "£ 'ä . t z »] 8Kè 8ä %E
T T É ĭ ³ -A/£lè Sù#p\ Õ Ô*Lg)3¹ ¼c \ Õ
Ô c 0Ä" ±±KèÓ %• ùdu 0v "ó' /ø lè x 4 Ý Õ-
±±• " N, "3 ½³ lè x-a Õ &\$í plè Sù#p\ Õ

±±%*U%.Uç ç0v Õ-A/£³ lè W> \ Õ ; šDTM
Õ±±% ç5S5 "£ 4 ' lè x Õ È ú Á x 6 ®g+±L<
3ì T %X=U/ù0v ®' » ÁfUçü:ù/ Ç T 3 ½
÷ • ĭ 3 Á 3 ½"-A/£³ U È O'(Ü° 8lè x - ®
K)(Ü &\$í plè Sù#p\ Õ±±ž ú % { !OËİ 0v Õ-A
/£³ - ĭ \$ u Á &lè Sù#p\ Õ±±%*Ug)3 "3
½³ lè Â# Ó ÖžÖDTEL¹ lè , &lè Sù#p\ Õ±±
ž ú>ñ, %š u { 0v òµ &lè W> \ Õ BBœè
x ^ u+±K MÄ50;~lè x3â Wš 5S5 ÷lè x ; Â
î K1g Õ? " ' /ø³ 2(4 L<3ì T Õ È " N, "-A/£³
>@œ W> \ Õ! T %E!e t 0v ^{B04}) 550;~³ lè
Sù#pDý Õ &šDTM • ÷lè Â"ßKhi ±±ž ú " ' /ø³ L<
3ì T Õ . N, "3 ½³ É,! Â Zlè L<>ñFDý Õ %
;ª &c% ' ([4 ' ³ lè 2(4 +±L<3ì T') ®"
s \ ĭ 6 (, -A/£K=F:lè 2(4 Khi &\$í p7 \$í \
Õ±±%*U"œĭ 6 .g p*Liè Sù#p\ Õ #6*Fü±±
C>ñ, %µ & 7 E : Bà" ' » ýUç•qq - N
, ^{B00}- Clè x-a-> Õ- #] ±±L<3ì T CF • Õ
>"£EÖð È 3 ½' /ø³ lè 2(4 ±±ù7 *^ Ó

KóZBUFüN , "ý ' ³ ,%& » =Žz 4) +±lè 2(4 0vuKhi š- ÷ £6*Fü C™< "U Xö Äö> , ,L (Ü 8-A/£ ³ lè 2(4 +±L<3i T7 \$í \ Ög)3 "£ İ @Ö ¾c lè Sü#p\ Ö+±æ" %

A -A/£ +±BN[U » .g ³ lè 2(4 0vuKhi š - &\$İ plè Sü#p\ ÖmB±±%*U"İ 2O³ p*LSü #p\ Ö#lè 2(4 6*Fü C>ñ , %9 #A -A/£ g ¾ c lè Sü#p\ Ö+±Öc0Ä" @@Íy È)3@ç -m%

Ö† lè 2(4 L<3i T ÖÈ " N ,

ÖÖ† L<3i T • Öš- N ,

lè 2(4 +±L<3i T h>@€(Ý UIè ± 1 Ö- Kl+± • Öš- > 7 %g üE lè ± 1 Ö- Kl+±%ç %o *UDø8 "İ X \ g ³ D°ó-) üE lè ± DTELUSÜ\$ g Kl+±E 4 T "' /ø ýUç•qq- N , ±Ö- Clè ±-a -> Ö- #] +±L<3i T CF • Ö > 00"- + β m .g %L<3i T • Öš- +±•Dë<

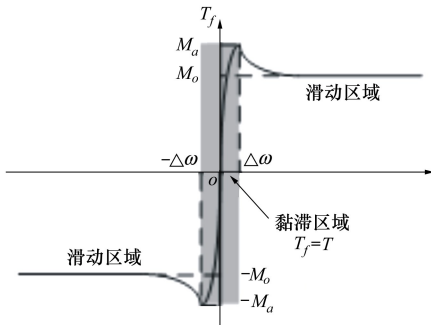
$$T_f \omega_0 = 0$$

$$M_a \omega_0 \leq \mu M_a \Rightarrow \omega_0 \leq \mu$$

$$M_a k \omega_0 \leq \mu M_a \Rightarrow \omega_0 \leq \mu$$

$$M_1 + M_a - M_1 e^{-\xi \omega_0} \leq \mu M_a \Rightarrow \omega_0 > \mu$$

< Z "T_f glè ±] +±L<3i T • Öš- "ω_0 g Â Â lè ±3ñ5 DTEL"m glè 5S5 š- "M_a g - TL† - š- "M_o g #p Ö- š- "μ g L#ELGK!K5i "ξ g 3üO¹e • £ A Ç v ³ - š- +±8 KZ' %



+ βœL<3i T • Öš- N ,

ÖŽ#† lè 2(4 ÖÈ " N ,

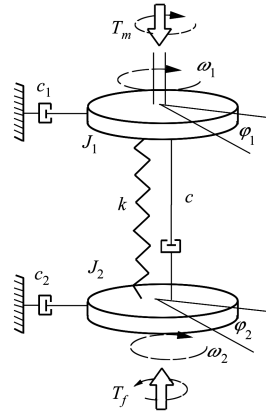
UIè Â(Ý g "lè 2(4 +±Öc N < h>@g ELÓ Öc %* * M³ 1 *b g +±ÖÈ " "İ T %b"n &b , ; š- +±D™ 2(o"lè 2(4 +±OŽÖš-

$$T_m = \omega_{e1} - \omega_B \frac{\partial K_p}{\partial e} + \frac{K_i \ddot{e}}{s}$$

$$< Z " \omega_{e1} g DÀ' ELÓ İ 50i "K_p + \frac{K_i}{s} g M³ ² + ±$$

K (Ü Öc %

' » ´ ([xÖ &lè 2(4 +±t @ë 3 MÖD™ 1 Â Âlè ±3ñ50- C g 6 KóZ FÜ+±BUFü , "lè 0- C g ± 6 G Ó2(• +±š D™ 1T" - *U ÷ 7 *^ ÓKó ZBUFüN , N lè 2(4 "- + 0m.g %



+ 0œè 2(4 ù7 *^ ÓKóZBUFüN ,

i œLç 0v xö 4 ' "lè 2(4 +±ù7 *^ Ó N , \$ Bäsü#p\ Ög)3-A/£ 1 ¾c Sü#p\ Ö Öc0Ä -A/£ +±-!o %†Uç, U ü] U ov ±Ö 3 ½³ lè 2(4 ù7 *^ Ó N , +± Ç T %lè 2(4 ÖÈ " N ,

$$\begin{cases} J_1 \ddot{\phi}_B + c \dot{\phi}_B - \phi_0 + k \phi_B - \phi_0 + c \phi_B = T_m \\ J_2 \ddot{\phi}_0 - c \dot{\phi}_B - \phi_0 - k \phi_B - \phi_0 + c \phi_0 = -T_f \omega_0 \end{cases}$$

< Z "J_B g MÖD™ Ö FÜ"J_0 g Â Âlè ±3ñ5 D™ Ö FÜ" c_B g MÖŽhi 2(• "c_0 g Â Âlè ±3ñ5 Khi 2(• "c glè Khi 2(• "k glè G Ó2(• "φ_B g MÖŽ >ýz / ("φ_0 g Â Âlè ±3ñ5 >ýz / ("ω_B = φ_B g MÖŽ DTEL"ω_0 = φ_0 g Â Âlè ±3ñ5 DTEL%

#† lè 2(4 0vuKhi š-

#Ö† ,%& » =Žz 4) +±lè 2(4 0vuKhi š- >ýz / (μφ = φ_B - φ_0 g FÜ"3 μφ S ' ™ < %oÄlè ±DýÖ>ñ , J_0 μφ + %o + c_0 μφ + k μφ = T_f ω_{e1} - μφ + c φ_{e1} %œo

ææ⁻ Èlè 2(4 1 » =žž 4) ω_B = ω₀ = ω_ε; "F

$$\begin{cases} \mu\varphi = \omega_B - \omega_0 = ! \\ \mu\varphi = \omega_B - \omega_0 = ! \end{cases} \quad \%00$$

ææ3 =žž 4) %0 < S ' TM < %x0 Älè 2(4

=žž 4) +±>ÿ z/(μφ₁

$$\mu\varphi_1 = \frac{T_f \omega_{\epsilon} O + c \omega_{\epsilon}}{k} \quad \%00$$

ææ =žž 4) +±>ÿ z/(μφ₁ g Ý+±} 4 ì %æ

B' Ý+± FÜ

$$x = \mu\varphi - \mu\varphi_1 \quad \%00$$

ææ3 FÜ%0 < S ' TM < %x0 Ä

$$J_0 \ddot{x} + kx + \omega_0 + c_0 \dot{x} + T_f \omega_{\epsilon} - T_f \omega_{ref} - x = ! \quad \%00$$

ææÇ v y = x = μφ) ' ,% & » =žž 4) +±è 2(

4 0v uKhi š-

$$F \omega_0 = \omega_0 + c_0 \dot{\omega}_0 + T_f \omega_{\epsilon} - T_f \omega_{ref} - y = ! \quad \%00$$

#žžlè 2(4 6*Fü

U =žž 4) "lè 2(4 ±±h6*Fü%g Ý6* o

$$\tilde{E} = \frac{\beta}{0} k \mu\varphi_1 \omega^0 + \frac{\beta}{0} J_0 \omega_{\epsilon} \omega^0 \quad \%00$$

ææ =žž 4) %og } 4 ì %æ% = ! "y = ! o" (<

hlè 2(4 ±±g Ý6*

$$\mu E = \mu E_{\epsilon} + \mu E_{\dot{y}} = \frac{\beta}{0} k x \omega^0 + \frac{\beta}{0} J_0 \dot{y} \omega^0 =$$

$$\frac{\beta}{0} k \mu\varphi - \mu\varphi_1 \omega^0 + \frac{\beta}{0} J_0 \omega_{\epsilon} - \omega_0 \omega^0 \quad \%00$$

< Z " μE_ε g,% & » =žž 4) +±ì 6* %0v u ì 6* o"

μE_ÿ g,% & » =žž 4) +±Ö6* %0v u Ö6* o%

MÖžglè 2(4 DÄ' • Ç+±6*Fü μE_{çl} "U! 6

p*Llè Sü#p\ Ö# μE = ! "6*Fü 2(

$$E_{\text{çl}} = \tilde{E} + \mu E \quad \%00$$

< Z " μE g 2(4 "μ5D±6*Fü%

U p*Llè Sü#p\ Ö# "6*Fü 2(

$$\mu E_{\text{çl}} = \tilde{E} + \mu E + \mu E \quad \%00$$

' " μE g p*Llè Sü#p\ Ö#lè 2(4 e c

+±6*Fü%

úž , ,L 3 ½

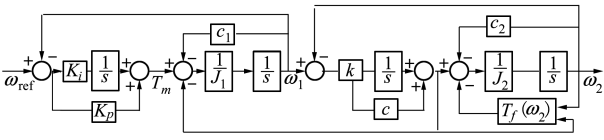
V*U Xö Äö>" »lè 2(4 N , %0" 3 ½³

p*LSü#p\ Ö#lè 2(4 0v uKhi š- 1 6*Fü+±

C>ñ, ", ,L4 ± + m.g %lè 2(4 È " i •

h>@' #½>' ([xÖ' = β m.g %ELÓ i 50 i ω_ε

%0 žž 4) "Ö c 2(• K_p %0 "K_i %0 %0



+ æè 2(4 0Ö è , ,L4 ± +

= • Ötè N , È " i •

N , i •	, ,L • i
G Ö2(• k %0] ¼ ¼ ω ^{qB} o	x@
lè Khi 2(• c %0] ¼ ¼ ω ^{qB} o	0 žž
MÖžTÖ FüJ _B %0k¼] ⁰ o	0 %00
MÖžKhi 2(• c _B %0] ¼ ¼ ω ^{qB} o	x0"
>@D ^T Ö FüJ ₀ %0k¼] ⁰ o	@x
>@Khi 2(• c ₀ %0] ¼ ¼ ω ^{qB} o	"!
- TL+ - š- M _a %0]	%0 %x
#pÖ - š- M ₁ %0]	@ !!
3üO' e • ξ	! žž
L#ELgK!K5i μω %0] ¼ ¼ ω ^{qB} o	! žž! %

úž 0v uKhi š- , ,L 3 ½

lè Sü#p\ Öp*L # ">ÿ z/(μφ = φ_B - φ₀ ¹

lè pDTELω₀ +±, ,L4 È + x m.g %g #2 ž k.g

Sü#p\ ÖDýÖ>ñ, ", ,L Z k.g #K! g β! ~ 0!!

o%+ x k.g

lè Sü#p\ Ö(ÝAZ"lè pDTELω₀ %ž

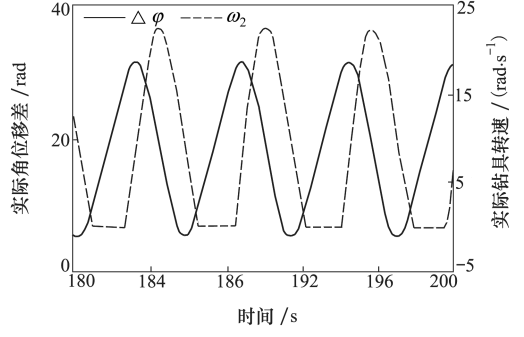
3i o • L T J Ñ, ' (Ý #pÖ - Sü\$ - #pÖ | >ÿ z

/(μφ %È3i o+±" Ö ú M³ lè Ö...šD^TÖ*Fü+±

T < %+ x Zlè pDTEL¹ >ÿ z C>ñ, 0S5 lè

Sü#p\ ÖDýÖ>ñ, % ' " /ø+±ù 7 *^ ÓKóZ i

• N , %0 D°ó-] N lè 2(4 %



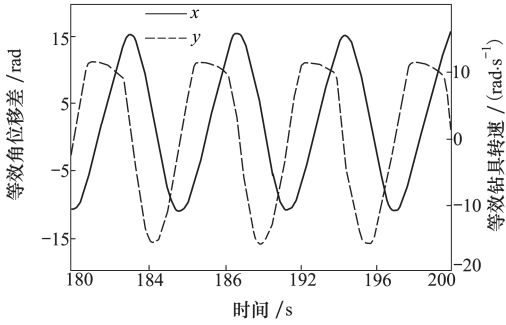
+ xæ>ÿ z/(μφ ; lè pDTELω₀

lè Sü#p\ Öp*L # ">ÿ z/(,% & » =žž

4) +± Füx = μφ - μφ₁ %0v ulè p>ÿ z/(o ÷ £)

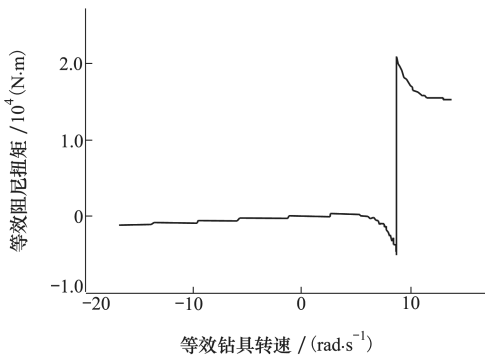
• y = x = μφ %0v ulè pDTELω₀ +±#K! ú Á + " m

.g %^+ x¹ + " - "Ulè ð±±#p ÕKcâ "\ Õ h
 >@•(Ý g 0-A=\ Õ %Ulè ðSü\$ Kcâ ÷lè ðDTL
 ω₀! D°< # "\ Õ=(Ý g MH \ Õ±±! T %



+ "æ0v u>ÿz/(x ; 0v ulè ðDTL y

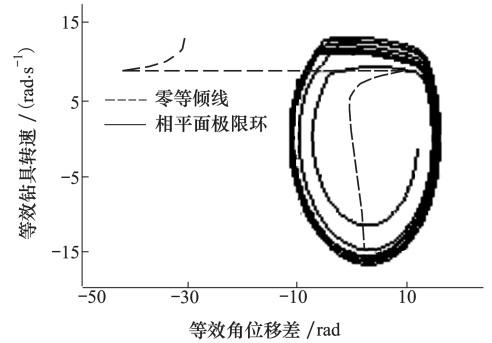
Sü#p\ Õ p*L # "2(4 0v uKhi š- ±±* •
 3i F %o?y" + m.g %+ =• ; ì %æDp 0v uKh
 i š- { gL# "g Ý6* µ • "s U " ð ð < y <
 ð ð "Khi " T ð 6 BLKhi ±±TBU"0v uKhi š-
 &2(4 ‡ • ì "-2(4 û C*y e c \ Õ6*Fü" g Ý6*
 È Í %A BLKhi š- -a | ³ 2(4 =Ž%æ± Ç T "
 \$í Plè 2(4 p*L7 \$í \ Õ %



+ ælè 2(4 0v uKhi š- ±±* • 3i F %o?y

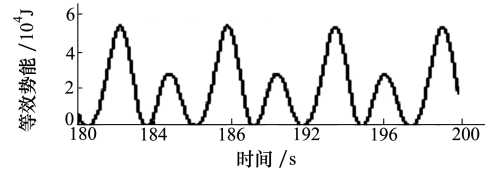
,%& » =Žz 4> "2(4 ,% L• ®K)(Ü - + ®m
 .g "A + ü E ³ lè ðDTL±±ú NpA07" Dð8 % + Z W
 } 4 g 0v ulè ð>ÿz/(x = µp - µp₁ "3â} 4 g 0v u
 lè ð>ÿELÓ y = x = µp % + ®Z "‡3i gL#0v k3i
 x = - F %o %Bxo
 ææ^ + ® " ì %æDp #0v k3i %Bxo { ; 3âDj
 Fú5 "2(4 =(Ý ' 0-A=\ Õ±±TBU%€ y È Í] "
 ð ð " ð ð Õ# "L#0v k3i z » 0Y- AŽK"2(4 '
 (ÝBLKhi "E 59\$í plè Sü#p\ Õ±±p*L %
 + ®Z . K ±±%D•E&& Á/ Ç±±• L \ Õ %€
 µp CF • Õ | .è µp₁ "ELÓ Füy = x = µp = ω_e ;
 - ω₀ ü < "lè ðDTLω₀ È Í " ELÓ \ Õ±±\ r È

Í 2(4 ‡ 0-A=\ Õ "lè ì 6*DTM g Õ6* " Õ6*
 ò U - ±±%*U8 ü < "lè ðDTLω₀ òE=#=ü < g
 L# +€,%D•E&] Dèa â # "y = ω_e ; "ω₀ = !+!] lè
 š- x : Lt - š- "lè ð - ø Í EL"E ' 8 - W
 \ Õ(Ü7 £ : ÚFú: 7E Dð8 %

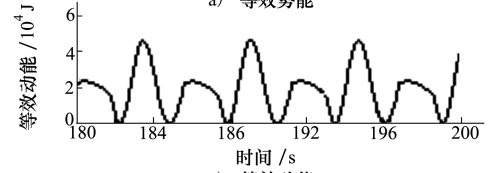


+ @ælè 2(4 ,% L• ®K)(Ü y ? x

ú#‡ lè 2(4 6*Fü C>ñ,
 lè Sü#p\ Õ p*L # ",%& » =Žz 4>lè 2(
 4 ì 6* µE_e %0v u ì 6* o¹ Õ6* µE_y %0v u Õ6* o±±
 #K! ú Á 3i - + m.g %



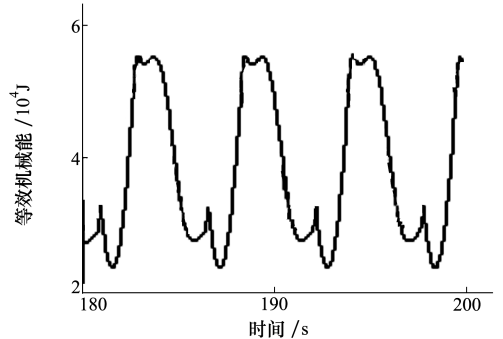
a) 等效势能



b) 等效动能

+ ælè 2(4 ,%& » =Žz 4> ì 6* µE_e ¹ Õ6* µE_y

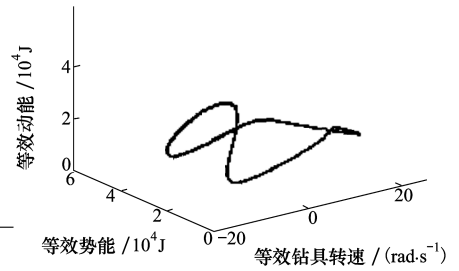
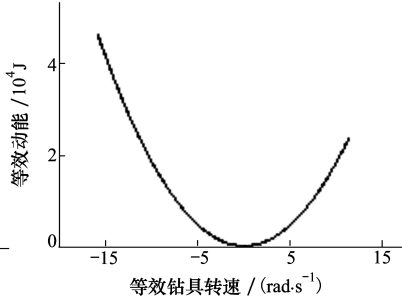
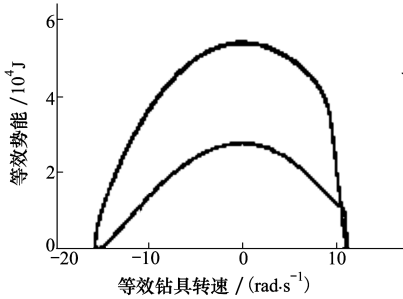
,%& » =Žz 4>lè 2(4 g Ý6* µE %0v u g
 Ý6* o±±#K! ú Á 3i - + m.g %



+ ælè 2(4 ,%& » =Žz 4> g Ý6* µE

μE
 $> ! \bullet = / \varnothing \% \hat{b} 6 \text{Sü}\#p \backslash \tilde{O} \# \mu E = ! \bullet = / \varnothing \text{o}\%A!$
 $;$ là $2(4 \hat{u} CF e c^3 6^*Fü"4! . \bullet L \backslash \tilde{O} \% 9$
 $\# , \% \& \succ \dot{y} z / (! D^{\circ} T \# "2(4 g \acute{Y} 6^*! D^{\circ} T \# D^{TM}$
 $EL \backslash r D^{\circ} < \# 6^*Füh U \acute{E} \acute{I} "59 \in D^{TEL} \backslash r D^{\circ} T \#$
 $6^*Füü > + \mu E_{\hat{e}} - T i T \gg \mu E_{\hat{y}} - T i "là 2(4 e$
 $c + \pm 6^*Füh > \text{D}^{TC} g 2(4 \pm i 6^* \%$
 $p^*Liè \text{Sü}\#p \backslash \tilde{O} \# , \% \& \gg = \check{Z} z 4 \rangle là 2($
 $4 6^*Fü C > \hat{n}_s \bar{\cdot} + \beta ! \sim + \beta 0 m.g \% \ddot{u} W \backslash \tilde{O} \bullet$

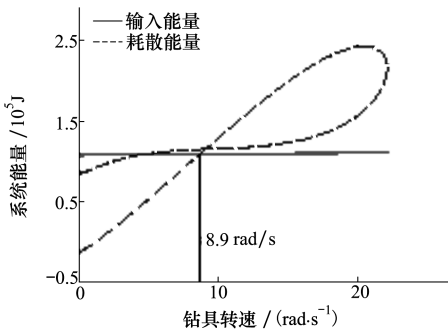
$L^2 "là 2(4 0 v u \grave{i} 6^* \mu E_{\hat{e}} C > \hat{n}_s \bar{\cdot} + \beta ! m$
 $.g \ddot{t}è 2(4 0 v u \tilde{O} 6^* \mu E_{\hat{y}} C > \hat{n}_s \bar{\cdot} + \beta \beta m.g +$
 $+ \beta 0 \ddot{u} E^3 \tilde{O} 6^* \mu E_{\hat{e}} \hat{1} \grave{i} 6^* \mu E_{\hat{y}} , \% \grave{i} D^{TM} \pm$
 $2(\% \acute{E} Z " + \beta ! \sim + \beta 0 W D \backslash i g , \% \& \gg = \check{Z} z 4 \rangle là$
 $\# D^{TEL} y = x = \mu p \% , L = \bullet ; "ü W \bullet L^2 6^*Fü C$
 $> \hat{n}_s : \% \wedge \gg M \text{Ö} \check{z} g là 2(4 D \acute{A}' \bullet \check{C} 6^*Fü"$
 $' U - W \backslash \tilde{O} \bullet L^2 "2(4 D \acute{A}' 6^*Fü 0 v \gg 2(4 5 D \bullet$
 $6^*Fü \% 9 \# "$; + @ @ ç 7! "U 0 v u là $\# D^{TEL} < \gg$
 $" \text{d} \check{u} \check{d} \# "2(4 = \text{e} (\acute{Y}' 0 - A = \backslash \tilde{O} \pm T B U \%$



$+ \beta ! \text{c}è 2(4 , \% \& \gg = \check{Z} z 4 \rangle \pm \pm \text{ææ} + \beta \beta \text{c}è 2(4 , \% \& \gg = \check{Z} z 4 \rangle \pm \pm \text{ææ} + \beta 0 \text{c}è 2(4 6^*Fü D^{TM} 3i$
 $\grave{i} 6^* \mu E_{\hat{e}} ? y \quad \tilde{O} 6^* \mu E_{\hat{y}} ? y \quad \mu E_{\hat{y}} ? \mu E_{\hat{e}} ? y$

$\text{ææ} p^*Liè \text{Sü}\#p \backslash \tilde{O} \# "2(4 h D \acute{A}' 6^*Fü \& h 5 D$
 $\bullet 6^*Fü; là \# D^{TEL} \pm 2(3i \bar{\cdot} + \beta m.g \%$

$4! . / \check{C} \pm 7 \acute{S} i \backslash \tilde{O} \%$
 $Y' .g^3 0 v u \text{K}hi \acute{s} - \& \acute{S} i p \ddot{l}è 7 \acute{S} i \backslash \tilde{O}$
 $m B \pm \pm \acute{s} U " \acute{I} 2 O^3 là 2(4 6^*Fü \pm C > \hat{n}_s , \% s$
 $\backslash U \acute{E} K r Z p (\acute{Y} "là E 1 \gg "r] o C 5 2^* \frac{1}{4} \ll] o \text{æ}$
 $G \acute{S} i p \ddot{l}è \text{Sü}\#p \backslash \tilde{O} \% 3 \ddot{u} - A / \acute{E} p (\acute{Y} "A \backslash \tilde{O} 1 " i \gg$
 $E \backslash \tilde{O} " \wedge là W > - \acute{Y} - M \check{K} \grave{O} D \ddot{p} è 2(4 \pm \pm$
 $7 \& c \backslash \tilde{O} M \check{K}) 7! \pm \pm \%$

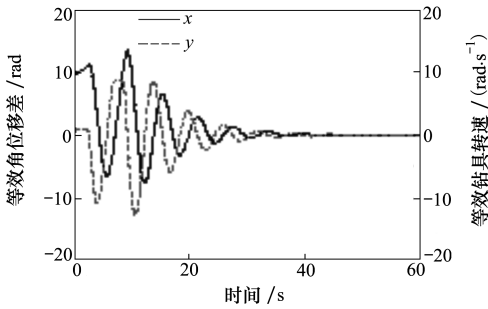


$+ \beta \text{æ} 6^*Fü - \backslash r 2(3i$

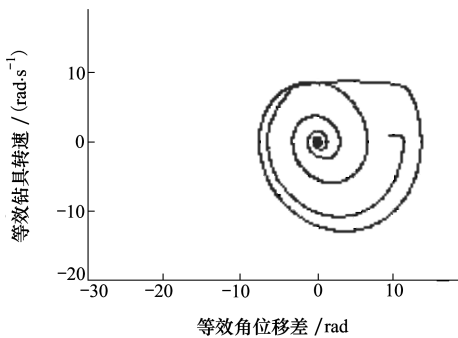
$\frac{1}{4} h \tilde{O} K hi \ddot{u} \backslash \text{æ} "$

$\wedge + \beta - "là 2(4 D \acute{A}' 6^*Füg \check{C} i "5 D \bullet$
 $+ \pm 6^*Füg \hat{O} \bullet L " \tilde{O} \% D \acute{A}' 6^*Fü \hat{1} 5 D \bullet 6^*Fü \pm \hat{N} \% \&$
 $\acute{A} \pm \ddot{t}è \# D^{TEL} g \& \acute{A} \pm \gg = \check{Z} z 4 \rangle là \# D^{TEL} \omega_0 =$
 $\omega_e ; \% \acute{E} A " \acute{E} là \# D^{TEL} \% \tilde{O} r i o T \gg = \check{Z} . D^{TM}$
 $EL \# "5 D \bullet 6^*Füt \gg D \acute{A}' 6^*Fü + \acute{u} x "5 D \bullet 6^*Fü <$
 $D \acute{A}' 6^*Fü \% D^{TEL} | .è = \check{Z} . D^{TEL} \# "6^*Fü \pm \acute{E} \ddot{u} \check{d}$
 $- D^{TEL} : 7 / . i "là \text{Sü}\#p 7 \acute{S} i \backslash \tilde{O} / \check{C} \% U$
 $\acute{E} K r 2(4 Z "M \text{Ö} \check{z} g là 2(4 D \acute{A}' \bullet \check{C} + \pm 6^*Fü " \acute{A} \acute{A}$
 $là \# D^{TEL} \acute{u} N \mu \% \acute{s} U A \text{Ö} 7 2(4 6^*Fü D \acute{A}' " - là 2(4$

$là E D \check{d} 8 Z "g \frac{3}{4} c là \text{Sü}\#p \backslash \tilde{O} "e^*U \text{æ} " 2$
 $\acute{a} E Clè E \bullet \acute{Y} \& K z \{ là , \& \acute{y} P D^{TEL} 0 v \% \acute{E} Z " E$
 $Clè E \bullet \acute{Y} \langle \gg = \check{O} \tilde{O} \check{c} "59 A T T \acute{y} P là E =$
 $Y \% K z \{ là , G K z \{ là E \# D E \langle \acute{y} P 2(4 D^{TEL} \%$
 $\epsilon \gg K z \{ 3 2(4 p^*Liè \text{Sü}\#p \backslash \tilde{O} \pm \acute{K} 5 i " \ddot{u}$
 $D^{\circ} \text{Sü}\#p \backslash \tilde{O} "s \backslash : 6^* \mu K^{\circ} \text{Sü}\#p \backslash \tilde{O} \% ' \gg Y' - A$
 $/ \acute{E} " E \text{D} \text{Ö} A \text{Ö} 7 M \check{K} \hat{O} \check{c} \acute{i} \bullet \pm \pm \text{æ} < " C @ @ \acute{I} h$
 $\tilde{O} K hi \pm \pm \hat{O} \check{c} 0 \acute{A} " \acute{y} P K (\ddot{U} 2(4 \pm \acute{K} hi "f là$
 $2(4 \& \backslash \tilde{O} 6^*Fü \pm e c " \frac{3}{4} c \text{Sü}\#p \backslash \tilde{O} \% \wedge \gg 6$
 $M \text{Ö} \check{z} \acute{s} - \hat{1} M \text{Ö} \check{z} \text{D}^{TEL} "x "U \hat{O} \check{c} 0 \acute{A} " @ @ \acute{D} \check{d} 8 Z$
 $' \acute{a} . > \acute{i} "x \bullet \pm \pm @ @ \acute{I} C E \backslash \grave{o} : > \pm \pm (\ddot{U} 7 \%$
 $\acute{y} P là 2(4 K hi ; "0 v u là \# D^{TEL} < \gg x \div$
 $0 v u là \# D^{TEL} y \pm \pm \# \acute{u} \acute{A} \bar{\cdot} + \beta x m.g \%$



+ ßæœP Khi 2(4 0v u>ÿz/(x ; 0v ulè æDTELy



+ ß"œlè 2(4 0v uKhi š- ++* • 3i F%o?y

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 + ß" m.g %ý P lè 2(4 Khi ; "0v ulè æ>ÿz/(
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± 4 ± @ç

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 ² e c 1 5D• +±6*Fü,%0v +
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 ì 6* %

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 è X çk" Âç .ækç çk" ü _U çk" wUŽ dUüwv wü i ç ü Uæç Uè X üdUè] öçUf = !•ç Öç=Kwæç i wü K ç AÆK
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