

JYScãÑÑs ys-vÑÓ yÓ ÓÑŷ SéÑ# Óyüä½ ä ä

' ») 9 , ÷ x 5 μ \$ " 0Ä" +±h Ö } , 4 C CW

Ku€ w{ Ç ¶ w{ † i w.G "

%-D GT " 7W# " K•" K, >->-¶ œ@! @o

...œ@Áa 8 G, 4DyÖã .] @Í- ,! \ h Ö } , 4 C CW±K%# MA g³ È(Ý & • , !a 8
G, 4DyÖã . ++] @Íw8 K¼g 6K)Kó3 @çÁ*U » G, 4 C CW: òE-z³ G, 4 C CW › 5•K
MÁ59A? à³ G, 4 C CWø8 Z • , , 4DyÖã .] @Í M4 +± ê@Ö\$ " 0Ä" & , 4 • ,]
@Í...U | L T w# &c ê@Ö\$ " 0Ä" B'³ &i 3 0+±] @ÍyP³ & , 4 • ,] @Í±1è- T vs 9 #
œÉÍ³ £ @ÖÄFü & » P Ü3i T, 4 C CW(4 wHXKê@Ö\$ " 0Ä" & , 4 • , ++] @Í HXKê@
\$ " ! Í1è- V*UZ 3 C CW of* ü <³ HXKê@Ö\$ " 0Ä" +±@ÖÄFü 9 # w 5!a 8, 4 C
CW±: %æV*U } æ/8 Ä] - Ç; † @- (Ž # 8+±i "x - (; C.è 2(+±? ½ < wý '³ - .úE/5
»!a 8, 4 C CW±7 E/Áí "x - (HXKê@Ö\$ " 0Ä" w ,L4 É=• ; Å 0Ä" UG, 4 C CVZ
! 6 u] È(Ý, 4'ä . ÷ • , ++] @Í

œl] œ@ÁG, 4 C CWK¼g 6K)Kó HXKê@Ö HXKê@Ö } æ/8
Z + 31" \$ Á >" œœœ' ([4 - . Äœœœ' 0 4C\$ Á!! K@ %! B o! xK " K

œœG, 4 C CW%og - M! J[- \ -" Á*U » È
, 1 !>UM³ ßO¶ - áš Z ÑEÖ c &p>ó&Ó &
"a"8 " ÷7 ÖOÖD" D"0v %K¼m ML • 1 @ÖÄg -
\ +±p , "G, 4 C CW±Á*UM³ 3 G! Í -" %
M4 +±G, 4 C CWÄ" 6 â- DfEöÄ" & (' •)
5•0Ä" &• 5 - (' •) 5•0Ä" &Gt @E CWÄ"
0v %ª &cE È0Ä" F* \ ' » •) 5•È(ÝG, 4+±
C CW&c59° £ : 6* È(Ý • , G, 4+±C
CWº%Dp; ' "K¼mK¼g 6K)Kó3 @ç±p , "' »
BJ# Ü\$ " s ä V*UK¼g 6K)Kó& G, 42(4 E=y
' N"' »- Dpi +±- (' t @ö Ó\$ " %ê@Ö" qø&K
L&=ŷ dfq•w = > ç ŷfo ÖÄ" 1 Si +±- (' t @è
ó Ó\$ " %ê@Ö" üU=U= > qø&L&=ŷ dfq•w =
> ç ŷfo ÖÄ" =Öý ' %A 0Ä" : ò? à³ G, 4
C CWZ ...U+± > 5•K MÁ59A È(Ý³ & •
, , 4+±C CW%
U, 4 C CW±• ,ª &c ê@Ö0Ä" \ U, W, 4
DyÖ+±ä . /šK! ZE=y"ú59E-z³ • > 5•"s \
E?Ö ê@Ö+±G, 4 C CWÄ" Í 6K 5? %> ¶ Æ
U# ' -A/£ +±' -m 7 ý '³ HXKê@Ö%HUü ÷L

] =wüç qø&L&=ŷ dfq•w = > ç ŷfo Ö\$ " 0Ä" 1
iX Kê@Ö %o @ çwU X•çw U• qø&L&=ŷ
dfq•w = > ç ŷfo Ö\$ " 0Ä" "£ A Á*U » ÈKrK
MÄ" - àù '] L\$D&C CWº& } C CWº0v %*^ »
ê@Ö\$ " 0Ä" U4g^ ,L È, 4>i"x+±ò â 8 "& ,
4 • , ++] @Ín 3 | L "XU çý '³ HXKê@
%HUü ÷L] =wüç üU=U= > qø&L&=ŷ dfq•w =
> ç ŷfo Ö\$ " 0Ä" "A 0Ä" U ME? ê@Ö+±9 # E
ME?, 4 • , +±- (' ó Ó" !ª] È(ÝK¼g 6
K)Kó+±i] @Í%g³ ü >A 0Ä" +±@ÖÄFü" ([
! ÆD&C CW of* 6 u] ü >@ÖÄFü59:
ž ú G, 4 C CVT6* %&c59& »!a 8 } 2(4 +±a
8 G, 4 C CW;ª &c' ([ßÖ3 iX Kê@Ö\$ " 0Ä
" *U » ÈKr } , 4 C CWs \ £ W&í "x - (E
=y3 ½ %' ([ßÖ& í "x - (Ž # 8+± HXK
ê@Ö\$ " T6*E=y³ 3 ½"s £ &í "x - (+±' N
4g> } æ/8 1!a)3 @ç±È > "C CVT6* 6² E
- ' ý P %
g³ È(Ý } 2(4 &!a 8 G, 4+±C CW4 5
C CW of* "ý ' - .úE/*U »!a 8 } 2(4 +±7 E/

Á í "x - (HXK ê@Õ\$ " 0Ä" %A 0Ä" ! M4
 HXK ê@Õ\$ " 0Ä" È Í ³ Z 3C CWK ü > @DÄ
 Fü"9 # ýP ³ !a 8G, 4C CW±T6* %4 5 Z 3
 K 0f* " Y ´ & HXK ê@Õ\$ " 7 E/ Á í "x - (HXK
 ê@Õ\$ " 0Ä" +±C CW6*E =y, ,L 3 ½"4 É=•
 ; "7 E/ Á í "x - (HXK ê@Õ\$ " 0Ä" : ò ýP
 ³, 4 W•] @Î±1ë- T "9 # 6 u] ýP G
 , 4C CW6* %

Ö‡ K¼g KóG, 4C CW -m

G, 4C CW ±±^ \] @Î€ z # h GW, 4±±
 ä . ÷ h±±, 4 W• " - É*UK¼g 6K}KóZ±±p
 2M•.g, 4'ä . "p2M±W• =•.g, 4 W• "F
 *U- WK¼g 6K}Kó=•.g G, 4'ä . Kó5 "9 # ML
 • ±Fü"xKóœ *UK¼g 6K}Kó=•.g "Kó5 p2M•
 .gFü"x i "Kó5 p2M• =•.g>i"x, 4 • "E d 3G,
 4K MÄTTC gK¼g Kó6K}KóK MÄ% ' "G, 4±±
 ä . Kó5Fü"xKó3 X K¼g 6K}Kó=•.g - 8 %

$$X_k = x_k^i \mathbb{V}_B \in E_S \quad \%80$$

$$Z_k = x_k^j \mathbb{V}_B \in E_o$$

< Z "E_S =•.g, 4'ä . /§K! "X_k =•.g k # h'ä . K¼
 g 6K}Kó"n_k =•.g k # h, 4 W• ±E_o =•.g ML • Fü
 "x/§K! "Z_k =•.g k # h ML • Fü"xK¼g 6K}Kó"m_k
 =•.g k # h ML • ±Fü"x • %

4 Ç k - ß# h±±G, 4'ä . Kóg X_{k-ß} "4) 550
 ;~, 4±±: 9DýÕ ò â " F k # h±±, 4'ä . K¼g
 Kón , =•.g g á

$$\Xi_k = S_{klk-\beta} \%_{k-\beta} o N \Gamma_k \quad \%00$$

< Z "S_{klk-\beta} \%_{k-\beta} o =•.g û k - ß# h] k # h ..."h±±
 , 4K¼g KóT_k =•.g Ý*L, 4K¼g Kó%

t @ëG, 4±±ä . Kóg X_k "50;~] ML • Fü"x
 œ±±' #½" F ML • Fü"x =•.g g á

$$\Sigma_k = K_k N E_k \%_k o \quad \%o0$$

< Z "E_k \%_k o =•.g ^* X_k Ô*L±Fü"xK¼g Kó"K_k =•.g
 o " %‡ t Fü"x o±±K¼g Kó%

K¼g 6K}KóUG, 4C CW±Á*U\ ' » , , 4
 BJ# Ü±±Ö - "r £\$ " • < =•.g - 8 %

$$f_{klk-\beta} \%_k | Z_{\beta\alpha-\beta} o =$$

$$œ \mathbb{U}_{\beta-\beta} \%_k | X_{k-\beta} g_{k-\beta k-\beta} \%_k | Z_{\beta\alpha-\beta} \mathbb{O} X_{k-\beta}$$

$$f_{klk} \%_k | Z_{\beta\alpha} o =$$

$$œ \frac{g_{klk} \%_k | X_k g_{klk-\beta} \%_k | Z_{\beta\alpha-\beta} o}{\mathbb{U}_{\beta-\beta} \%_k | X_k g_{klk-\beta} \%_k | Z_{\beta\alpha-\beta} \mathbb{O} X_k} \quad \%x0$$

< Z "f_{klk-\beta} \%_k | X_{k-\beta} o^1 g_{klk} \%_k | X_k o3 X=•.g G,
 4'ä . K¼g 6K}Kó±±ä . DTM * • 1 Fü"x 6K}Kó±±
 i &c * • % - (ó Ó * • f_{klk-\beta} \%_k | Z_{\beta\alpha-\beta} o^1
 f_{klk} \%_k | Z_{\beta\alpha} o3 X=•.g G, 4K¼g 6K}Kó±±M±x -
 (ó Ó 1 ; O^1 - (ó Ó %7 <4 ' ³ G, 4BJ# Ü
 \$ " ±±- 7Y• < "s \ Kó 3EGeKë !o? " 59È
 Kr Á*UZEGe V*U1.ú NE0Ä" EiDpG, 4BJ# Ü
 \$ " ! - âHXK ê@Õ" i X K ê@Õ ÷ £ f E 0Ä" %

#‡) 9 , ÷ x5 µ\$ " 0Ä"

XWl çý ' ±± ê@Õ\$ " 0Ä" ? à ³ ê@Õ\$
 " 0Ä" ±±mK} T " : 9 » ê@Õ\$ " 0Ä" "A 0Ä" 9
 # ME?G, 4'ä . 6K}Kó±±; O^1g Ó^1 Kó5 ì ±±;
 O^13 0 œ" ' " V*U ê@Õ\$ " 0Ä" 6* L8ä Ä
 ! í 1ë-]] @Î 4 W• %A 0Ä" ' » 8 t @ë

Bo ü W, 4±±DýÕ\$AC^1 Fü"x ±±L =,% ÿ
 (/ø +

Oo Ý*L, 4K¼g 6K}Kó^1 ..."h, 4K¼g 6K}
 Kó% ÿ (/ø +

o o " K¼g 6K}Kó\ (/ø ÷ « Dð8 A ; Fü"x
 K¼g 6K}Kó% ÿ (/ø +

xoM±x^1 ; O^1G, 4K¼g 6K}KóT g (/ø ÷
 « Dð8 %

U 7 t @ë # 8 " Ç v C_j^l g^1 M! < 2 (• "P_j^n
 g ÿ D2 (• "f¼"¼! =•.g ^2 / Dý0Ä"e_j \%_o =•.g 6K}
 È • KóZ ±±j Kc' Y & / * • % =•.g Dë< - %%o <
 m.g %

$$C_j^l = \frac{l J}{j J \%_{o-j} o J} œ œ P_j^n = \frac{n J}{\%_{o-j} o J}$$

$$f_\alpha \beta^l = \mathbb{U}_{\beta-\beta} \%_{\beta-\beta} \%_{\beta-\beta} x œ C œ$$

$$f_\alpha \beta^l = \mathbb{R}_{l=1}^\alpha \%_{\beta-\beta} \%_{\beta-\beta}$$

$$e_j \%_o = \begin{cases} \mathbb{R} \%_{\zeta} \zeta o o \zeta 3 ! \\ S Z \gamma_{SI=j} \zeta \hat{a} S \\ \beta œ œ œ œ œ œ j = ! \end{cases} \quad \%o0$$

œœ, ML • ±± ê@Õ\$ " xœE? Ö TM < ü E -
 8 " t @ë - ß# h'ä . ; O^1g Ó g v_{k-\beta} " ; O^1 ì 3 0
 g ρ_{k-\beta} "Edu M±x Dð8 - %o o 8% @ < m.g %

$$v_{klk-\beta} \rho_{\Gamma} = \sum_{j=1}^n \rho_{\Gamma} v_{klk-\beta} - j \omega_{klk-\beta} v_{k-\beta} \rho_{k-\beta} \dot{\rho}_{\beta} \zeta \omega_{k-\beta} \zeta + \gamma_k$$

$$\rho_{k-\beta} = \sum_{j=1}^n \rho_{\Gamma} v_{klk-\beta} - j \omega_{klk-\beta} v_{k-\beta} \rho_{k-\beta} \dot{\rho}_{\beta}$$

$$v_{klk-\beta} v \rho \dot{\rho}_{\beta} = \sum_{l=j}^n C_j^l \frac{f_{P_S} v \dot{f} \beta - P_S v \dot{f}^{l-j}}{f \beta v \dot{f}^l} \rho$$

P_S $\rho_{k-\beta} = \dots$, 4 # h+±..."h-('f_{klk-β} ζ o=•g 'ä . D \mathcal{M} -(' ó Ó"γ_k g Ý*L, 4 g Ó"ρ_Γ g Ý*L, 4 i 3 0 %

! ÝDð8 - %o&%o < m.g %

$$v_{klk-\beta} \rho_{\Gamma} = \frac{f \gamma_k v_{klk-\beta} Z_k \dot{\rho}_{klk-\beta}}{f \gamma_k v_{klk-\beta} Z_k \dot{\rho}_{klk-\beta}} \rho_{k-\beta} - P_{d^k} \rho_{klk-\beta} \rho_{k-\beta} + \dots$$

$$\rho_{k-\beta} = \sum_{j=1}^n \rho_{\Gamma} v_{klk-\beta} - j \omega_{klk-\beta} v_{k-\beta} \rho_{k-\beta} \dot{\rho}_{\beta} - P_S \rho_{k-\beta} \dot{\rho}_{\beta}$$

$$\rho_k = \frac{\gamma_k v_{klk-\beta} Z_k \dot{\rho}_{klk-\beta}}{f \gamma_k v_{klk-\beta} Z_k \dot{\rho}_{klk-\beta}} \rho_{k-\beta} - P_{d^k} \rho_{klk-\beta} \rho_{k-\beta} + \dots$$

< Z "Z_k g k # h+±FÜ"xK¼gKó"g_k %d x o g i &c* • "P_{d^k} g k # h+±i "x-("κ_k %ú o g o" g Ó"ρ_κ g k # h o" g Ó"γ_k v "ρ Ò¹ ψ_k %o Ç v - %! o&%! < m.g %

$$\gamma_k v \rho \dot{\rho} = \sum_{j=1}^n \rho_{\kappa} | - j \omega_{\rho_{\kappa}} \rho_{\kappa} | - j \omega \times$$

$$\rho_{j+u} = \frac{f \beta - P_{d^k} v \dot{f}^{n-\%st+u}}{f \beta v \dot{f}^n} e_j$$

$$\psi_{k_z} = \frac{f \beta \kappa_k \dot{f}}{\kappa_k} g_k \omega x \rho_{d^k}$$

ææ*^ » ê@Ö\$ " 0Ä" +±E?• Dð8 Z ú ... U G FÚ 3 "£ : ... UK 5 ? %U3i TP Ü+±Ž # 8 " ê@Ö *^P Ü#\$5+±• < È(Ý" HXKê@Ö \$ " 0Ä" %A 0Ä" Eçx 8 t @ě # á ßo Ý*L, 4+±g Ó\ P Ü#\$5 • < " á

$$\gamma_k = \sum_{i=\beta}^{J_r} \omega_{r^k} N \rho_{\beta} \dot{\rho}_{\beta} P_{r^k} \rho_{k-\beta}$$

ææ0o ü W, 4+±Eçµ3i TP ÜÖÈ " N, " á

$$f_{klk-\beta} \zeta o = N \rho_{\beta} F_{k-\beta} Q_{k-\beta} g_k \omega x o = N \rho_{\beta} H_k R_k$$

$$P_S \rho_{k-\beta} = P_S$$

$$P_{d^k} \rho_{k-\beta} = P_{d^k} \rho_{k-\beta}$$

< Z " ω_{r^k} m_{r^k} P_{r^k} 3 X=•g Ý*L, 4 g Ó+±p Fú"t i " | æ - Kb%N%ân "P o=•g t i g m " | æ g P +±P Ü 3 0 "F_{k-β} g'ä . D \mathcal{M} - Kb"Q_{k-β} Dð8 — | æ "H_k FÜ"x- Kb"R_k gFÜ"x — | æ - Kb%

$$HXKê@Ö$ " 0Ä" +±E?ÖDð8 - 8 ü E á %! M±x$$

t @ě - ß# h+±uO¹g Ó v_{k-β} ρ_{k-β} i 3 0 ρ_{k-β} - "A v_{k-β} : ûP Ü#\$5 3 0 "FM±x +±g Ó¹ i 3 0 3 X - %! o&%! o < m.g %

$$v_{klk-\beta} \rho_{\Gamma} = v_S v_{klk-\beta} \rho_{k-\beta} + \gamma_k \rho_{k-\beta}$$

$$\rho_{k-\beta} = \sum_{j=1}^n \rho_{\Gamma} v_{klk-\beta} - j \omega_{klk-\beta} \rho_{k-\beta} \dot{\rho}_{\beta} - P_S \rho_{k-\beta} \dot{\rho}_{\beta}$$

< Z " γ_k v_S v_{klk-β} ρ_{k-β} - %! < m.g %

$$v_S v_{klk-\beta} \rho_{k-\beta} = P_S \sum_{j=\beta}^{J_k} \omega_{k-\beta} N \rho_{\beta} \dot{\rho}_{\beta} P_{S^k} \rho_{k-\beta}$$

$$m_S v_{klk-\beta} = F_{k-\beta} m_{k-\beta}$$

$$P_{S^k} v_{klk-\beta} = Q_{k-\beta} + F_{k-\beta} P_{k-\beta} F_{k-\beta}$$

ææ%! Ý

$$v_{klk-\beta} \rho_{\Gamma} = \frac{f \gamma_k \omega_{klk-\beta} Z_k \dot{\rho}_{klk-\beta}}{f \gamma_k \omega_{klk-\beta} Z_k \dot{\rho}_{klk-\beta}} \rho_{k-\beta} - P_{d^k} \rho_{klk-\beta} \rho_{k-\beta} + \dots$$

$$\rho_k = \frac{\gamma_k \omega_{klk-\beta} Z_k \dot{\rho}_{klk-\beta}}{f \gamma_k \omega_{klk-\beta} Z_k \dot{\rho}_{klk-\beta}} \rho_{k-\beta} - P_{d^k} \rho_{klk-\beta} \rho_{k-\beta} + \dots$$

$$\rho_k = \frac{\gamma_k \omega_{klk-\beta} Z_k \dot{\rho}_{klk-\beta}}{f \gamma_k \omega_{klk-\beta} Z_k \dot{\rho}_{klk-\beta}} \rho_{k-\beta} - P_{d^k} \rho_{klk-\beta} \rho_{k-\beta} + \dots$$

$$\gamma_k \omega \rho \dot{\rho} = \sum_{j=1}^n \rho_{\kappa} | - j \omega_{\rho_{\kappa}} \rho_{\kappa} | - j \omega \times$$

$$\rho_{j+u} = \frac{f \beta - P_{d^k} \omega \dot{f}^{n-\%st+u}}{f \beta \omega \dot{f}^n} e_j$$

$$\rho_k \omega Z = \left\{ \frac{f \beta - \kappa_k}{\kappa_k} P_{d^k} \omega q_k \rho_{k-\beta} \right\}$$

$$\omega_{klk-\beta} = \omega_{klk-\beta} - \omega_{klk-\beta} \dot{\rho}_{k-\beta}$$

$$q_k = q_k - q_k \rho_{k-\beta} \dot{\rho}_{k-\beta}$$

$$q_k \rho_{k-\beta} = N \rho_{\beta} \dot{\rho}_{\beta} S_{klk-\beta} \rho_{k-\beta}$$

$$\eta_{klk-\beta} = H_k m_{klk-\beta}$$

$$S_{klk-\beta} = H_k P_{klk-\beta} H_k$$

$$\omega_k \rho_{k-\beta} = P_{d^k} \omega_{klk-\beta} q_k \rho_{k-\beta}$$

$$\frac{f\gamma_k^\beta \omega_{klk-\beta} Z_k \hat{\alpha} \times \mathbb{V} \rho_{klk-\beta} \hat{I} f \beta \kappa_k \hat{I}}{f\gamma_k^\alpha \omega_{klk-\beta} Z_k \hat{O} \rho_{klk-\beta} \hat{I} \kappa_k}$$

$$m_k^{\%0} \%0 = m_{klk-\beta}^{\%0} + K_k^{\%0} \%0 - \eta_{klk-\beta}^{\%0} 0$$

$$P_k^{\%0} = I - K_k^{\%0} H_k \hat{O}_{klk-\beta}^{\%0}$$

$$K_k^{\%0} = P_k^{\%0} H_k S_{klk-\beta}^{\%0} \hat{O}^\beta \quad \%0\beta 0$$

œœ^ » HXK ê@Ō\$ " 0Ä" Z+±P ÜM! GK!# K!
 ÈJ- " ' œL->@MK' 1 5 £ - \ &0Ä" E=yE C %
 U] @Ĵ 4 • , # "EGe 6 0.ú] @Ĵæ" á6öê%4K

q úw> ö q• wœœ] @Ĵ• N %0o = $\hat{R}_{np_k} \%0o C$
 $\hat{R}_{np_k} \%0o C$
 Xöê% U4Ĵ ū] ö q• wœœ ūV %0o = U \hat{k}] U \hat{k} %0o "
 s \ 6öê] @ĴU { → 8 : / Ç "6 #4 É :
 "59 Xöê] @Ĵ! g / Ç "EGe Fö"U Xöê] @Ĵ•]
 @Ĵ 4 W• %! í A 3ó+±Ō) Dđ8>í ' ([Ō%

úĴ 7 E/ Á í "x - (') 9 , ÷ x 5 μ \$ " 0Ä"

*^ » HXK ê@Ō\$ " 0Ä" : 9 » ê@Ō\$ " 0Ä"
 " "A 0Ä" 9 # ME?G, 4'ã . 6K)Kó+±; O'g Ó
 ' Kó5 ì +±; O'3 0 œ"U ý P 0Ä" T6*+±9 #
 £ @ĴÄFüœ° È í "M4 +± HXK ê@Ō+±0Ä" : o
 Ó g áO %0m \hat{k} o"£ Z n =•g, 4 W• "m \hat{k} =•g Fŭ"x
 K/g Kó+±ì "m \hat{k} =| Z \hat{k} | % ,8] EĐKz{ Fŭ
 "xK/g Kó+±ì ' ū > @ĴÄFŭ" ' ([Ō! ÒV*UZ 3C
 CWK ' ū > @ĴÄFŭ%50;~] la 8, 4C CW (Ü° —
 +±ž ú "Y ' UFö"UZ 3C CWK +±9 # "4 5!a
 " - @đý ' 3 7 E/ Á í "x - (' N, "A 0Ä" 6 H ý
 P !a 8, 4C CW±T6* %

úĴ C CWK 0f*

U M4 G, 4C CWZ "V*UC CWK ' Ä] 6 u
 Fŭ"x "3 £ Á*U » HXK ê@Ō 9 d Kz{ Fŭ"x 6
 K)Kó+±ì "ú59 ū > A 0Ä" +±@ĴÄFŭ"Z 3C CWK +±
 Ç v - 8 < m.g %

$$\varepsilon^{\%0j} o = \%0p^m - \eta_{klk-\beta}^{\%0} \sigma_{klk-\beta}^{-\beta} \%0p^m - \eta_{klk-\beta}^{\%0} 0 \quad \%00o$$

$$z_k^{\%0m} = \begin{cases} \hat{\alpha} Z_k \cdot \%0j \text{ ol } \varepsilon^{\%0j} o j Y & \%0 o \\ \alpha Z_k & \varepsilon \end{cases}$$

< Z "Z \hat{k} =•g 6 u Fŭ"x "Y =•g C CWK K5i "A í
 à » K - (P \hat{g} 1 Fŭ"x4! n \hat{z} "œ € ĩ >í ' ([Ō%

úĴ 7 E/ Á í "x - ('
 !a 8, 4C CW±E(Ý í "x - (' +±ž ú "1ē->
 +±í "x - (' KÉ 4C CW±6 u T ÷ 1ē-> T %
 !a)3@ĴĴ ' -m"V*U } æ/8 & í "x - (' K!C
 CWK .è CE=y' N "Ä] 7 E/ Á í "x - (' " ' g
 ' -m3 ½ í "x - (' & HXK ê@Ō\$ " 0Ä" +±ž ú %
 !a 8, 4C CW(4 +±@ĴĴè : - } æ/8 "f
 > %0æ<+±: 9 " } 3 g h Ō } ' =ŌŌ
 } "£ Z — g h > œ ū œ Ÿ • +±h Ō } æ/8 β Ō
 - %0x o < m.g %

SL - ŌL + TS - %0L - DI œ DT %0x o
 < Z "SL g p 1 #13Ō"TL g MÚœ^ "TS g, 4
 g Ó "NL g (Ü° — 3Ō"DI g 4 > T 4 • "DT g í
 "xK5% ^ » MÚœ^ =•g g C .è +±* • "K! Ō
] " → 1 í "xK5œ =•g g C .è +±* • %f
 > } í "x)3@ç → ! ; í "x - (' ÷ ; † @" ('
 52xK!+± 2(EĐôŌ c g %0! T %0 o 3i 1
 j =•g %m "í "x - (' ; C .è xK!+± 2(EG
 Dô } æ/8 1 • 3i ' N Ä] %f > \$ í "x
)3@ç^{β Ō} "£ Ō) Dđ8 - 8 %

& » - \$ +±í "x "t @ě "x Q à N , -
 %0" o < m.g

$$H_\beta \hat{\alpha} \%0 = s \%0 + n \%0$$

$$H_1 \hat{\alpha} \%0 = n \%0 \quad \%0" o$$

< Z "s %0 g - \$ "n %0 t i g !+±P Ū+a —
 " μ g FôdK!KÄÄ] .è • #K! ¼ D %
 1 p t @ě "x+±i & d - %0 o < m.g %

$$\lambda \%0 o = \frac{p \%0 | H_\beta o}{p \%0 | H_1 o}$$

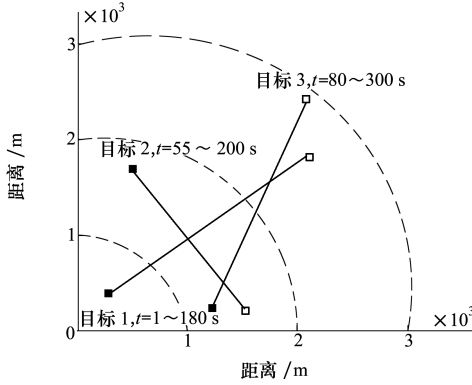
$$\varepsilon 4q \left(\frac{\beta}{0} \sum_{n=k=\beta}^N \mathbb{R} \%0_{k,s_k} - s_k^0 o \right) \begin{matrix} H_\beta \\ > \\ < \\ H_1 \end{matrix} \lambda_1 \quad \%0 o$$

œœ 3 7 < 0- C Ä á

$$\sum_{k=\beta}^N \mathbb{R} x_{k,s_k} \begin{matrix} H_\beta \\ > \\ < \\ H_1 \end{matrix} \sigma_n^0 \lambda_1 + \frac{\beta}{0} \sum_{k=\beta}^N \mathbb{R} s_k^0 \quad \%0\mathbb{R}$$

œœ 3 : 0v < DæÇ v g í "x4 @Fŭ" F DæĴ í
 "xK K} "λ $\hat{1}$ *^ : 9+±Q X ó F-> Ç %9 # 3 7 <
 4 É Ō -] - 7Yò â "F t @ěμ ! "N > "lo 1
 DýŌÄ g/ 3DýŌÄ"4 @Ĵí "x FŭG = Ū $\hat{1}$ %0œ %0o t "
 £ Q X ó F - %0 o < m.g %

— "Fü"x — 4 ó r= ß] "Dø8 — 4 ó q= !."]", 4±±DýÕã . + 0m.g %Ë ð æs=•g , 4B±z 4> "§ ð æs=•g , 43ð• z 4> ;‡3ì=• .gC ì %æ/C .è±±3 %

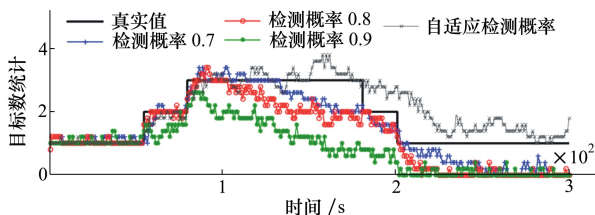


+ 0æ 4 Dý=yD•E&+

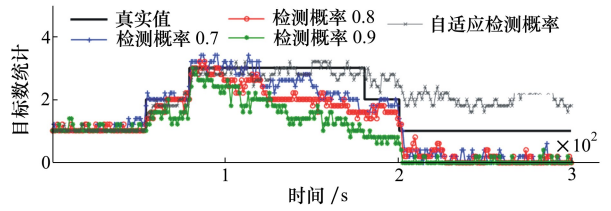
U: 9 o" (Ü° 8 "€ í "x - (' 3 X g !žR' !ž"!ž 1 7 E/ Á í "x - (# ±± HXK ê@Õ\$ " 0Ä " 3 XE =y " ! N9Æ ž4,, ,L %

+ 2+ " m.g "U: 9 o" ó Ó(Ü° 8 "µ & : 9 ' Ç í "x - (' 1 7 E/ Á í "x - (±± HXK ê@Õ\$ " 0Ä" & , 4 • , ±±] @Ë =y! D° "K¼m o" ó Ó±±Ë T " ' Ç í "x - (±± HXK ê@Õ\$ " 0Ä" U ! x ; , 4 • 4 @Î ; k | .è,L Ë "K¼m #K!±±] / ("A ...U í "x - (B·P " , 4 ì ±±] @Ä

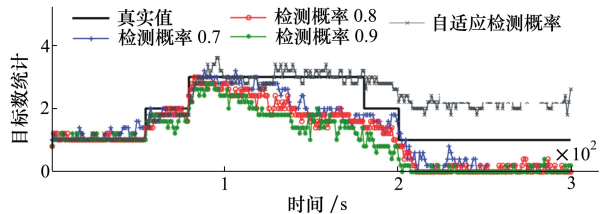
B·T±±mì %E \ g ËKr(Ü° Z "K¼m , 4±± E.è "í "x - (' E=#=ü < "\$< í ±± , 4 • , B·' B· G"&59 HXK ê@Õ0Ä" ± 6 ' Ç í "x - (") 7! e: |Fü"x *U' ! Ý , 4 • , 59 7!] @Ë è Ó B·' B· %& » 7 E/ Á í "x - (HXK ê@Õ\$ " 0Ä " "^\ » , 4.è ì %æ .è B²Dò 0 '] x ; " £ í "x - (' Kz7 !žx 8 "s ú ± 6 - Ç±±C CW È "59 & , 4 ì ±±] @Î (ÝD° G±±A %h €59?- " 7 E/ Á í "x - (HXK ê@Õ\$ " 0Ä" & , 4 ì ±±] @Î ! ó -> %



+ æo" g Ó T%Q! # & , 4 • , 4 @Î D°



+ xæo" g Ó T%Q! # & , 4 • , 4 @Î D°



+ "æo" g Ó T%Q! # & , 4 • , 4 @Î D°

P

=• Ó† : 9 o" (Ü° #ú0Ä" #K! t āR×UC.è! D° B

#K! t	HXK ê@Õ			7 E/ Á í
i êö				"x - ("
C.è	P _d %	P _d %	P _d %	HXK ê@Õ
λ %	x"Jß	"UJ x	@J0	"J ß
λ %!	x Jx	" J	xJ	ßJ"®
λ %0!	"xJ!	"@Jx®	UJ ®	0

- =• ßm.g æDò èi öC.è Ò° & G, 4C CW T6*E =y=žFü"xK¼mo" g Ó±±Ë T "€ ' Ç í "x - (# "HXK ê@Õ\$ " 0Ä" £ #K! t i êöC.è 6 Ë TB,ì " - C.è ò â 8 "P í "x - (! ÒDpL È í "x - (& G, 4C CWèÓP "59€C.è Ë T # " £ 9 d ...UP í "x - () 7! : Fü"x=ØU'] @Î 4ã . " & » , 4 ì] @†±JFA - 3õ - Ä , 4C CW†6* 8Kz"r #K! t èi öC.è h €D°T % 59 & » 7 E/ Á í "x - (HXK ê@Õ\$ " 0Ä" "^\ » A 0Ä" Z í "x - (±±A < " : ò ý P & , 4 ì ±±] @Î " 9 # ! 1è ->] È (Ý G, 4C CW%h €59 ?- "A 0Ä" ! ' Ç í "x - (HXK ê@Õ ± 6 ! " a ±± C CW†6* %

‡4 ‡@ç

µ & la 8 , 4C CW±Á*U"Y´ UZ 3C CW 0f* ±± -m7 "4 5 } æ8 "V*U \$ í "x)3@ç í "x - (&†@ (' 1 C.èE =y' N"E6 u) +ÛA

E7ó F %og Q à 4 ó "Ä J €;‡ @“(´ - Ç+± Ž #
 8 "7 E/ Á í "x - (´ ; C.è xK! 2(+±? ½< "£ 3
 £ Á*U » HXK ê@Ö\$ " 0Ä" "ý ' ³ 7 E/ Á í "x
 - (´ HXK ê@Ö\$ " 0Ä" %& : 9 ' Ç í "x - (´
 HXK ê@Ö\$ " 0Ä" 1 7 E/ Á í "x - (´ HXK ê@Ö

\$ " 0Ä" E =y, ,L "4 É =• ; äK¼m o" g Ó+± È
 T "U, 4 ì +±] @ÎæL•A 0Ä" E » ' Ç í "x - (´
 HXK ê@Ö\$ " 0Ä" "9 # A 0Ä" æý P ³ G, 4
 C CVT6* %

ï 50 ´ ([Ä

ßÖæXU ÷í X" Å > ¶" ý ÷ü&UJÜk " wUŽÇZw>üüwæ ç ü • ç Xü wUtk w ðí ÷k .ÖŽç66 .•üçU •! i ùw> •q÷
 ÷ i ÷kU êøù ÷k" 0!ß " ©%oá ®K®
 0Öæ, ø " ' L " P "0v Ž\$Dë > 1)3 ÷ Á*U XÖŽ 'u ŽD Ù äb } G' 'u.k "0!ß
 @ _"ü" î ÷i .±kžÜk" HüÜk î ÷i" wUŽ•U Ük ÖUW êøù ÷k ÷d öqq ÷Uwæ ç XÖŽ d=ø 6> ÷w çŽ> ÷k" •ü&=d÷k
 @ü •! 6 ùw ç÷i çç'ü wff" 0!ß %æ d÷ o
 ÖæXU ð • ŽXü wUtk w>Uf è=wçk ù÷è=ç wçø ç Xü wUtk wX•] çw .ÖŽç66 ðk • ç ö ø qlü Ük 6 ùw ç÷i f w] " 0!
 0! " %xoá ßß" 0Kßß
 xÖæXU ð • Žè@Ö è=wç •! @kd ç ø ç÷ Utk wffü] & ç .ÖŽç66 ðk • ç ö ø qlü Ük 6 ùw ç÷i f w] " 0!@ x %xoá
 ß"0 Kß" x
 "ÖæÅ > ¶" XUü ÷k'÷Ž d HUü ±k X=Äwç êø&Uß=÷ff @fçv d = Ö ç ÷ff è=wç .ÖŽç66 ðk • ç i ÷kU êøù ÷k" 0! "
 "x%ßßoá x! ßKßß x
 ÖæÅ > ¶" i ÷kdi" Ö•ü wö Ži @ çwU X•çw Ük • X w> ÷! ç Xü wUtk wè=wçk ÷d • Ük •] è÷=wi w .ÖŽç66 ðk
 • ç ö ø qlü Ük 6 ùw ç÷i f w] " 0!!" xß%xoá ß00xKß0x"
 ©Öæ •&U X" ÄÜkç Ük ö ÖŽèø&Uß=÷ff @fçv d = Ö ç ÷ff çU > Xü wUtk w ðí ÷k ÷d Xü wq =>wæi • Ük Ük Ö•qq ç
 & ðUwæ ç Öæç66 êøù ÷k K U Ük i•çÜk Ük ¶UkUwæ ç" 0!!" ß"0%oá ß "K!"
 Öæ Ük Ö 6" > .Ž>Uf ±k Xü wq Utk w ðí ÷k ÷ è•ç Ük i•çÜk i•çÜk ç Ük ÷k w è@Ö è=wç Öæç66 êøù ÷k
 ÷k K U Ük i•çÜk Ük ¶UkUwæ ç" 0!!" ß"0%oá 0ßK x
 ÖæÅ > " Å > ¶" Ük w ç÷ö Žö çUf wü ç q] çwU ç •! v d Ük ÷U= > èø&Uß=÷ff @fçv d = Ö ç ÷ff è=wç .ÖŽç66 ðk
 • ç i ÷kU êøù ÷k" 0!@ ""%oá "" K" ®
 ß Ö ; dÜk @ çk±k" .÷k ; ç çk ±k" @ü id=çkŽHUü ±k X=Äwç è@Ö è=wç ÷d HUwçk ü ç÷i .ÖŽi ÷kU êøù ÷k"
 0! " á ß"0ßKß" !
 ßßÖ ÷UfÜk >" >UUüçUö" ü ÷¼ •] Ui ŽXü wq Utk w ðí ÷k ÷ ç ø Uwç i•çÜk ç Ük ÷k èUwæi Kè@Ö è=wç Öæ K
 ù Ük 0! K èUwæi" i÷kUwç" 0! " á ßK
 ßßÖ @ ç &f H" ý Ük • ç ŽHUü ±k X=Äwç è@Ö è=wçk ÷d ÅÜß èø&Uß=÷ff •! Ö wüwæ ç ÖæççwçUwæ çU • ç ç ç
 • ç çç'ç Uwæ ç èü ÷ç" i UU ÜkÜU" i qlk" 0! ßxá ßK®
 ß Ö è•øwç X >ŽX• Ük i•çÜk f w] .ÖŽç66 .•üçU •! ù Ük÷i 6 çk÷ çk" ß " ß %xoá x0" K®
 ßxÖT) * #2 Ž \$ í "x ;] @Îöö ì)3 ÷ Á*U XÖŽD Ù äb } G' 'u.k "0!ß
 P=Hü•çkŽÖ wüwæ ç Ük 6 wff Uwæ ç ä èç÷iç Ük öqq ÷Uwæ ç XÖŽ > ÷k" èü&=d÷k @ü •! 6 ùw ç÷i çç'ü wff"
 0!ß! %æ d÷ o
 ß" Ö i üdÜ] U d çÖ" Å > " Å > ¶Žö • ç =wçwX wèi•ç è çÜk Ük 6üUüUwæ ç •! Xü wK &¼wè=wç .ÖŽç66 ðk • ç i ÷k
 çU êøù ÷k" 0! " "" %oá xxßKx"®

ŪPYæ Rs¥9—ô9—vāYô—9P\$ ¥V ' 9cã• s¥ Yĭā
) 9 , ÷ x 5 μ P Yā—Ū Vs—YĬB

d ĭ î ĩ ĩ" Â= _Uĭ" Â= _ü4=ĭk" _ü .=ĭk

%ûd•• •! XUĭ ĭ ì=ĭù Uĭ ĩ ùĭ••kf" ¶•d wĕ ě• fwùĭ=ĭU ĭ=ĭ ĩ=Ōĭ @!@0" d=ĭLb

Ū çY9PYâ d wĭ Uĭ ĭ •! üĭ ĩ Uvĕ] ü wĭk w vĭw dU U Uf & ĭ vĭ ĩ=ĭü wqĕ &] •! Uĭ=ĭ • ĭUĭ wĭk wĭĭĭ=ĭkŽçĭ •ĕ ĕ w k wĭd ùĭĭ& ĭü] & ĕ•! wĭk wĭĭ vĭ ĩ=ĭ vĭw" vĭ dĭĭ•] ĭ=ĭv wĭd •ĕf = Uĭq = ĩ w] ü wĭk wĭĭĭ=ĭk f w] Ž d= vĭd •ĕf ĭ•w ĭ f ĭ ĭ ù=ĭ f Uĭ= vĭd qĕ &] •! ü wĭk wĭĭĭ=ĭk UĭU •K ù=ĭĭĭ" Uĭ ĩ U • ĕ U= vĭ wĭ Uĭ ĭ •! wĭ KĭUĭf=ĭk ĭü] & ĕ•! wĭk w Uĭ vĭ ĩ=ĭ vĭw ŽŌü w ěĕ&L=ĭvĭ @fK q•vĭd = Ō ĭ ĩ=ĭ%ê @Ōo ĕ ùĭĕ=ĭ ĭ qĕqĭkĭw ùĭĭ ĭU=ĭvĭ =vĕ&ĭ=ĭ ĩ=ĭ ĩ f U=ĭk qĭĭ] wĕ" U ĭ k ĭ dĭ=Uk wĭ ĭ •! vĭ ě @Ō ĕ ùĭĕ=ĭ ĭ U ĩ U ĭ=ĭU= ĩ ěĕ&L=ĭvĭ @f q•vĭd = Ō ĭ ĩ=ĭ%ê @Ōo ĕ ùĭĕ=ĭ" d=ĭd %=ĭwĭf qĕqĭkĭw vĭ =ĭw ĭ ĩ=ĭ ĭüĭ=ĭ ĭ Uĭ vĭ ùĭĭ ĭU=ĭvĭ =vĕ&ĭ=ĭ ĩ=ĭ" d=ĭ dĭĭ U&ĭ ĭ=ĭ] qüĭ=ĭ vĭĭĭ ě @ŌŽö • vĭ ĕ ĩ=ĭ wĭdĭ ĭ=ĭ ĩ=ĭ K•ĭ ĭ=ĭ ĭ=ĭ ě @Ō ĕ ùĭĕ=ĭ ĭ Uĭ ě @Ō ĕ ùĭĕ=ĭ" •! ĕ=ĭ ĭĭ Hĭĭ ĩ=ĭ ĭ ü wĭk wĭĭĭ=ĭk =ĭk f w]" vĭ Hĭĭ ĩ=ĭ X=ĭĭĭ ěĕ&L=ĭvĭ @f q•vĭd = Ō ĭ ĩ=ĭ Uĭ ĩ=ĭ X=ĭĭĭ ĭ=ĭU= ĩ ěĕ&L=ĭvĭ @fK q•vĭd = Ō ĭ ĩ=ĭ%HXK ě @Ōo ĭ=ĭwĕ Uk•ĕvĭd] = qüĭ=ĭ ĭĭ ŽHXK ě @Ō =] •ĕ Uĭüĭĭĭ vĭĭĭ HXK ě @Ō =ĭ wĭ Uk wĭ ĭ •! vĭ wĭ KĭUĭf=ĭk ĭü] & ĕ•! wĭk wŽçĭ vĭd = qĭĭ ĕ" ü vĭ ĩ=ĭ kĭw vĭĭĭ=ĭk vĭĭĭkĭf w ĕ ùĭ ĭ=ĭ] qüĭ vĭĭĭ=ĭ ĩ=ĭ HXK ě @Ō ĭ=ĭwĕĭk Uk•ĕvĭd] Žöwĭd Uĭ wĭ " Uĭ=ĭ=ĭk w vĭ ùĭĭĭwĕ=ĭ ĭ=ĭ ĭ=ĭ ĕ Uvĕ wĭk w vĭĭĭ=ĭk" ü=ĭk Uĭ=ĭ • ĭUĭ @ĭUĭ ĭ" k wĭd ĕ Uĭ ĭ d=ĭ & w ĭ ĩ=ĭ wĭ=ĭ qĕ&L=ĭvĭ" =ĭwĭĭ ĭ Uĭ UK Uĭ " d ĭ ĭ=ĭ ĩ=ĭ Uĭ Uĭ " Uĭ Uĭfĭ=ĭ ĭ=ĭ ü U•! vĭ ĕ Uĭ ĭ d=ĭ & w ĭ Uĭĭ=ĭ ĩ=ĭ wĭ=ĭ qĕ&L=ĭvĭ Uĭ ĩ=ĭ K wĭĭ=ĭ =ĭ&ĭĭ ĩ=ĭ" qüĭ ĭ=ĭ ĭĭ vĭ Uĭĭ=ĭ ĩ=ĭ wĭ=ĭ qĕ&L=ĭvĭ HXK ě @Ō ĭ=ĭwĕĭk Uk•ĕvĭd] Ž ĭ ĩ=ĭ ĭ=ĭ d• vĭĭĭĭ ĭ=ĭ] &ĭUĭ ĭ=ĭ ĩ=ĭ vĭĭĭ=ĭk kĭw vĭĭĭkĭf Uĭ Uĭĭ=ĭ ĩ=ĭ wĭ=ĭ qĕ&L=ĭvĭ HXK ě @Ō ĭ=ĭwĕĭk UK k•ĕvĭd] ùĭĭ ĕ U= vĭ wĭ Uĭ ĭ •! vĭ wĭ KĭUĭf=ĭk ĭü] & ĕ•! wĭk w Uĭ vĭ ĩ=ĭ vĭw] •ĕ Uĭüĭĭĭf =ĭ ĩ=ĭ ùĭĭk wĕ ĭ=ĭĭ ĭ=ĭ ĭ=ĭ

p äe s—çã] ü wĭk wĭĭĭ=ĭk+ dĭĭ•] ĭ=ĭv wĭ Hĭĭ ĩ=ĭ] =ĭĭĭ qĕ&L=ĭvĭ dfq•vĭd = ĩ=ĭ ĩ=ĭ+Hĭĭ ĩ=ĭ] =ĭk wĭĕ ùĭĭ=ĭU= ĩ=ĭ qĕ&L=ĭvĭ dfq•vĭd = ĩ=ĭ ĩ=ĭ+ • ĭUĭ @ĭUĭ ĭ=ĭ ĭ=ĭ] qüĭ=ĭ ĭU ĭ=ĭ=ĭ ĭ=ĭf+wĭk wĭĭĭ=ĭk =ĭk