

Fô*U, 4VL- ; §6* E C+±T>ñN é Rÿç/(Ö/- *¼• › cKó

E"_"_ ^{isw} w/8 ½⁰ wM• 2 wš y

æž-¶7WŠ "K• @DÄg "K•"K,>->-¶ œ@!@+ 0žV. .p - T" œ; /8.p " "K•" W. ' y « œ !! t̄
é ž-D GT " @DÄg "K•"K,>->-¶ œ@!@

...œ@Áµ & T>ñN 3i ML4~• › 1)34~4 "nFüt (Î # #P +±4gKwý ' 3 - .ú ' »7 E/ Á „
, 4VL- ; .è • f T-Ý È E C0Ä" +±(Ö7%æ › cKóæu NÄu WEDô3 ¼4~ 3 „ ; 7%æ 4Y
xK!+± 2(wý ' 7 E/ Á „ , 4VL- • › FðKóf* wË(Ý ML • 7%æ »7 E/ Á4~4 „ , 4VL- • ›
FðKó @@î(Ö7%æ › FðKó ±>ñ?0f* ' 1 G/(Ö7%æ 9@DÄg c WEDfôUE/ Á Ói 3ÓCE •
1)3 - \ ' £=y.è • f T-Ý È E C0Ä" Wè] t =ž4~4 7%æ 5D' Kz{ • › 1)3 (Î # #±, ±±
- ; w ,L4 É=•; w • › cKóæu6* L 6 u È(Ý T>ñNML4~• › P u 1)3 W9AKz{ 3 4~4 "n
Fü' 4~4 (Î # # w^a t =ž³ 4~4 7%æ 5D

œ] œ@ÚÁ 3i ML • 4~4 , 4VL- .è • f T-Ý È E C • › cKó
Z + 31" \$ Á ê œœœ' ([4 - . Äœœœ' 0 4C\$ Á!! K@ %! 0! o! OK K

œœ 3i ML • 4~4 %œ ç ç • ç ç w • ç " üi¶ og ç 1"%çh EL] 8ä 1.úBç#½ œ"È # 6 u+±pÖ, 4 g 'ã . ý È 3 6* B0"£=Ø- " Á*U »(Ü ° í "x & Ä% %M@&È , * K_0vM3 % &c59@DÄ...Ö6* È 6K) & Î N < , - Bç#½-Bf R FÜv = g c3Ó üi¶ # Óp , +±#M¶K MÄ⁰⁰%&c 59'K¼m üi¶ >ñN+±: Ú - T "L->@1)3+±7%æ › u(Ý3%âç ÈJ- 'E & üi¶ EG 6* È 5D' A! 3 \ @T+±> E %^ » T>ñN üi¶ Z+±p"x , # EE < » ML • 7%æ Fü" ' Ut =ž4~4 6*5D+± 9 # @î L•/- *¼• › FðKó\ T>ñN üi¶ - J[+±K MÄ% , 4VL- %â] qç =è ç =ç" i o)3 @ç °&(Ö ök çwç •&= Uk çwXöo x0v- \ +±: Ú =&ì "6 u ý P 3 T>ñN üi¶ • › FðKóu(' " , @@! Í / ÇP u+± i ÷ Xö0f* ' ú \ € z üi¶ • › FðKóA/£ & %æ%g ' " 52- , 3 , % 2(D-A/£ â{ S|0v 'óý ' 3 - .ú ' » , 4VL- 1 > 3 ? C^ E C+± • › cKóæ" " 3 g/- *¼1)3 1 C ±

E C 0W' ON' @i³ • › cKó+±P 1èÓ "s \ K¼m 4~4 >ñN+±È T "C ± E C@DÄu(Ý3 %âç ÈJ- + ' ([Öý ' 3 ' » g C , 4VL- +± • › cKóæ " " 3 ü Wg (/ø " =y, 4VL- "û59E-z U • › MDÄð8 • =D°T+± • › "n"s \ "xFü- Kb@D° g : o + ' ([@Öý ' 3 - .ú 3 , 4VL- 1 ê kU= C *^ | @ÿ4 5+± • › cKóæu "WEDôUEG J+C Z , 4V • › È(Ý #J-4~4 *L ... • L+± , +±"s Î 50 ;~J+C : L • ò â A4~4 6*5D£ : - Ç6* LDè] - < L Hi +ü 0v 'óý ' 3 - .ú 3 Á6ö @314¹ , 4VL- 4 5+± • › cKóÄ" "È(Ý 3 D°P u(' +±4~ 4 • › cKó"s A 0Ä" !Î 6 r 350;~14² 7%æ › , % T "J+C Qçj TD° æ@) 7!7%æ 5DDô % s 7E -A/£ t W50;~/(Ö7%æ/- *¼• › Fôd Dð8+±ž ú "9 # /- *¼ \$Fú±0Ä" +±T6* ÇE! Ö ž ú,m- ; • › cKóÄ É+± Ó °, z T>ñN • › 1)3 u(' { Fú±0Ä" i • Kè E6 & \$/- *¼ Ó , u- Ç0v4gKwú \ Ì L-? à+±K MÄ† f E 0Ä

c/l L ÄO!B KISK œœœœœœ' FpMi, ÁZ * ‡ ; .p " ' Fp %!B X " @ o&K, >., ‡ ; .p " ' Fp %!B >i @P_i X00B3o; K,>., Fú%æ p@î? - 7YMi, %! 0! H_K xdBQÖ %520- ø ÄE"_"_ %B Bô o">-¶7WŠ "K•t µ &-D GT " ‡ ; "h>@ú , 3i ML • 4~4 -A/£ %

" - - 0- , <° 5 : 91" , E C0f* " £ Î 6 # ' 3
 ½<° 5+±5)3 T +æT G • E C0Ä" ;ª &c- , ³ .ú
 4Ñi 20ŞK! "s \ 4g>.ú 4Ñd Y G d T)3 @ç ½ \
 ¾+e f E E C0Ä" µ T/8 Ó 7 Ē Í ³ Ē(ÝKëÓ 1
 @ÐÄ: o Ó "&59E Ē'Ş 'Ý \$ j !Î 6 Ä] BÀLFü
 >ó%Y ' N ' - €K! ®- +±;% ç %*UDð8 " -Ý Ē
 z ; ' -)3Fü C %og " • E C g c "ý ' - .ú §6*
 E C0Ä" õõõ f T-Ý Ē E C0Ä" %o U wü ù => ç
 • qw = U w ç U k • c w] " 6 o £ Í .è • C " 9 # û
)3 @ç Ÿ Ó & 0Ä" c ^ T 1 • m (E6* Ē E =y 3 ½ %
 lµ & 7 E K MÄ'Y ' T>ñ N M L 4 ~ / - *¼ • >
 c Kóg Á *U5ùæ "ý ' - .ú 7 E / Á „ , 4VL- ; .è
 • f T-Ý Ē E C0Ä" +± • > FðKóæu â & " ¶ ÷ ± 7
 E / Á „ , 4VL- • > FðKóúf* & (Ö 7 %æ > FðKó
 C ± > ñ ? ÷ G / (Ö 7 %æ 9 @ÐÄg c E =y A 3ó ü
 E " Dè] ü > 4 ~ 4 • > E G h F ü & z { 4 ~ 4 # # 1
 6 * 5 D @ o + ± , + ± %

Ö 4-4 N ,

, 4VL-)3 @ç ± ý ' g \$ FðKó1)3 S ' ³ •
 Ý-A/£ J C " £ V * U { 4 ! / Ş K ! > F ü > i " x • > ^ 6 * L
 Ē (Ý & P 4 ! \$ ± ± ó - > L - % & » N 4 ! \$ x_{N × B} "
 * U • Ñ - K b ψ_{N × N} = x ψ_B " - " ψ_N W E = y = • g "

$$x_{N × B} = ψ_{N × N} s_{N × B} \quad \%o$$
 < Z " s_{N × B} g N × B ! > F ü % € s_{N × B} ò 6 K % • N o
 W L < L # 2 (• # " F s_{N × B} U ψ_{N × N} \ / - *¼ + ± " / - *¼ Ó g
 K % E D ð < , % " x F ü - K b φ_{M × N} 3 x_{N × B} Ä ž] { 4 !
 " x F ü > F ü_{M × B} 7 " Ä] M W x F ü • > "

$$y_{M × B} = φ_{M × N} x_{N × B} = A_{M × N} s_{N × B} = A s \quad \%o$$
 < Z " A_{M × N} = φ_{M × N} ψ_{N × N} % € M • N # " %o < g M
 Ç æ / 8 3 ñ " s - Ē s_{N × B} B à L / - *¼ " A A_{M × N} \$ B à • ç È
 Ž # Ò ð # " E D ð o ? - < l_1 80 • / - *¼ F ú ± ' s_{N × B} "

] = À s Ä_{l_1} œ œ ž ž = A s = φ ψ s \quad \%o
 œ œ & » ý „ M L 4 ~ g ² T > ñ N F 4 Ÿ Q W M L •
 7 % æ ± 3 i M L • 4 ~ 4 W = x s_j W % o = B " 0 " - " Q o "
 V * U ; † - \ 3 W ? 3 g V W ; † 14 V = x z_j W % o ,
 g 0 Y j W ; † 14 j = B " 0 " - " V o " Ē (Ý & : 9 g
 + ± ± ð Ô % & » ; † 14 z_j " f > M L • 7 % æ * 5 D " U \$
 B à 4 ~ 4 > ³ , > @ o + ± ò â 8 " E 6 - Ç 7 % æ » % o
 ' ä . % o % 7 % æ g G o % z_j + ð Ô g ² 6 N W ,

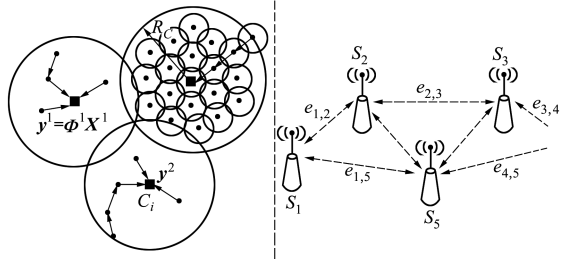
½ % o K g p * L , # + ± , # # ½ W • o " @ ç_i = • g Z_j
 ² % 7 % æ s_i FðKó] + ± • > % o = B " 0 " - " G o " F M
 L • • > > F ü X_{G × B} = % o " f_0 " - " f_G o + @ æ_k g 0 Y k % o
 = B " 0 " - " N o W , # # ½ \$ g Ó " F , # # ½ \$ >
 F ü s_{N × B} = s_B " s_0 " - " s_N Ò " 6

$$X_{G × B} = ψ_{G × N} s_{N × B} = \begin{matrix} \hat{e} \hat{e} & \hat{e} \hat{e} \\ \hat{e} \hat{e} & \hat{e} \hat{e} \end{matrix} \begin{matrix} \psi_{N \times B} \\ \psi_{N \times B} \end{matrix}$$

< Z " ψ_{G × N} g M Ú - K b % f > , 4VL-)3 @ç E 6
 M % M < G o W M L • • > ^ Ä] s_{N × B} " ' V
 * U > i " x - K b φ_{M × G} & X_{G × B} E = y E 6 " Ä] " x F ü > F ü
 y_{M × B}

$$y_{M × B} = \begin{matrix} \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} \\ \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} \\ \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} \\ \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} & \hat{e} \hat{e} \end{matrix} \begin{matrix} \psi_{N \times B} \\ \psi_{N \times B} \\ \psi_{N \times B} \\ \psi_{N \times B} \end{matrix}$$

œ φ_{M × G} X_{Q × B} = φ_{M × G} ψ_{G × N} s_{N × B} \quad \%o
 E g e ' A ! " 9 - # h N W , # # ½ Ô * L > F ü , # %
 • N o " s_{N × B} \ K Ó - *¼ + ± % , % - A / £ = • ; " € F ð
 * U % o ~ % o < D k + ± ψ_{G × N} 1 φ_{M × N} # " φ_{M × G} ψ_{G × N}
 6 * @ T - (\$ B à • ç È Ž # " ' V * U i -
 \ " L - > @ > F ü M L • 7 % æ > " ^ Ē (Ý + ð Ô ,
 + ± " - + B m . g %



a) 块压缩感知能耗分析 b) 移动节点协同计算

+ B œ „ E G ; | 9 @ Ð Ä N ,

F ð * U , 4VL- - \ µ T / 8 Ó + ± K z { ³ • > FðKó
 F ü " s \ " U • > E G K c â & 7 % æ = y • > FðKó ú L -
 " µ 5 D - Ç # K ! " û 59 E M = • > # # % C " U M L 4 ~
 F 4 Ÿ J L " 7 % æ - \ µ / M ó + ± " ' # 3 Z_j Ö . + ±
 ? 3 g C W ² 6 , % 9 w ± R_c + ± , " f > 4 ~ 4 > ³ , > @
 ! o Ö) ' R_c = √ 0 η R % o g 7 % æ E G w ± " η g
 " ² - T E G C • o % € Z_j 4 ~ 4 % 7 % æ Ó g λ
 # 6

$$C = \frac{G}{\lambda R_c^0} = \frac{G}{0 \lambda \eta^0 R^0} \quad \%00$$

k&c"ü W,, # 6 0 = G/C W %7%æ' # ü W,,
 0v u g - W ü i ¶ % & » Z_j ² 0Yi W,, %Bj i
 j C o"E6 z » ,, Z ð z 4) ±7%æ » ,, Z ð C_i "U
 ' lt 5±,, ² = FôKó ±7%æ » " £ V*U Φ_{i×0} E6 ,,
 ² I W7%æ = y • > FôKó %R I = M o" Ä] > i"x \$
 y_{i×B} = Φ_{i×0} X_{0×B} %€ m 6 ,, ¹ = • > FôKó; "(ÖT
 %æ & "ñ? C ±lt Kóm 6 ,, Z ð • > " Ä] "x FÜ >
 FÜ y_{M×B} = x_{i×B} V% = B" O" - "C o

$$y = \begin{matrix} \hat{e}^{\beta} \hat{u} & \hat{e}^{\beta} X^{\beta} \hat{u} & \hat{e}^{\beta} \Phi^{\beta} \\ \hat{e}^{\beta} \hat{u} & \hat{e}^{\beta} X^{\beta} \hat{u} & \hat{e}^{\beta} \Phi^{\beta} \\ \hat{e}^{\beta} \hat{u} & \hat{e}^{\beta} X^{\beta} \hat{u} & \hat{e}^{\beta} \Phi^{\beta} \\ \hat{e}^{\beta} \hat{u} & \hat{e}^{\beta} X^{\beta} \hat{u} & \hat{e}^{\beta} \Phi^{\beta} \end{matrix} \cdot \begin{matrix} \hat{u} \hat{e}^{\beta} \hat{u} \\ \hat{u} \hat{e}^{\beta} \hat{u} \\ \hat{u} \hat{e}^{\beta} \hat{u} \\ \hat{u} \hat{e}^{\beta} \hat{u} \end{matrix} =$$

$$\Phi'_{M \times C} X_{C \times B} = \Phi'_{M \times G} \Psi_{G \times N} \quad \%00$$

û %00 < ,, 8 ' Φ'_{M×G} g ,, - Kb" A =
 Φ'_{M×G} Ψ_{G×N} " F A C E g ,, - Kb%*^ » A Z X 6 T F ü
 e! | p 2M" ' T T K z { ³ 7%æ > FôKó FÜ "59 A-A
 /£ = • ; " & » 9 - .ú /- *¼ \$ Fú ±0Ä" "€ Fô*U,, > i
 "x- Kb# "/- *¼ \$ • : ELÓ! & ë Ó! P %
 *^ » 3 ,, W • C B • T ,, ² EG N • E Í +9 d
 C B • < ,, K! E G N • E Í " ' L->@5)3-> Ç C T
 < = Ž ,, ² ¹ ,, K! E G %
 4 @ç Óæ € 4-4 3 ,, C 8 i # " - Ä ,,
 ² ; ,, K! E G u ±- T %

$$C = \frac{G}{\lambda R_c^0} = \frac{G}{0 \lambda \eta^0 R^0}$$

$$\eta = \sqrt{\frac{\mu_B}{0 \lambda \mu R^0} + \sqrt{\frac{\mu_B}{\epsilon_0 \lambda \mu R^0} \frac{\ddot{0}}{\varnothing} + \frac{\beta}{\beta \textcircled{0}}}} +$$

$$\approx \sqrt{\frac{\mu_B}{0 \lambda \mu R^0} - \sqrt{\frac{\mu_B}{\epsilon_0 \lambda \mu R^0} \frac{\ddot{0}}{\varnothing} + \frac{\beta}{\beta \textcircled{0}}}} \quad \%00$$

< Z "μ_B â %b"βo&_o â %b"βo 3 X g ,, K! E G ;
 ,, ² EG ±± Ô c 2 (• " A μ_B + μ₀ = β %
 @î; œ-> Ç 4-4 3 ,, C ±± ±± \ = Ž ,, ² ¹
 ,, K! E G 6*5D" 6] = F' = μ_BC + μ₀Γ = μ_B ¼

$$\frac{G}{0 \lambda \eta^0 R^0} + \mu_0 \Gamma \%g ,, ² EG h C • o\%^- + \beta B$$

$$C = \frac{G}{\lambda R_c^0} = \frac{G}{0 \lambda \frac{\mu_B}{\epsilon_0} \sqrt{\frac{\mu_B}{0 \lambda \mu R^0} + \sqrt{\frac{\mu_B}{\epsilon_0 \lambda \mu R^0} \frac{\ddot{0}}{\varnothing} + \frac{\beta}{\beta \textcircled{0}}}} + \sqrt{\frac{\mu_B}{0 \lambda \mu R^0} - \sqrt{\frac{\mu_B}{\epsilon_0 \lambda \mu R^0} \frac{\ddot{0}}{\varnothing} + \frac{\beta}{\beta \textcircled{0}}}} \frac{\ddot{0}}{\varnothing} R^0$$

m.g " ,, ² 7%æ > L->@a C] DëCH_i ±±7%æ G_a
 = λ %a R⁰ = λ a⁰ R⁰ "9) 3L->@ > a - β C] Dë
 C_i ±±7%æ G_{a-B} = λ %a - β 0 R⁰ " ' • a L->@ a
 C] Dë C_i ±±7%æ G_a g

$$G'_a = G_a - G_{a-B} = \lambda a^0 R^0 - \lambda \%a - \beta 0 R^0 =$$

$$\approx \lambda \%a - \beta R^0 \quad \%00$$

' ,, ² 7%æ EG C • Γ' g

$$\Gamma' = \left(\frac{\eta}{a = \beta} \right) a G'_a = \left(\frac{\eta}{a = \beta} \right) \%a - \beta \lambda R^0 \quad \%00$$

m 6 3 1414 ² 7%æ EG C • g

$$\Gamma = C \Gamma' = \frac{G}{0 \lambda \eta^0 R^0} \left[\left(\frac{\eta}{a = \beta} \right) \%a - \beta \lambda R^0 \right] =$$

$$\approx \frac{G}{0 \eta^0} \left[\left(\frac{\eta}{a = \beta} \right) \%a - \beta \lambda \right] =$$

$$\approx \frac{G}{0 \eta^0} \left[\frac{\eta}{\eta} + \beta 0 \frac{\eta}{\eta} + \beta 0 - \eta \frac{\eta}{\eta} + \beta 0 \right] =$$

$$\approx \frac{G}{0 \eta^0} \left[\frac{\eta}{\eta} - \frac{\beta}{\eta} + \frac{\beta 0}{0 \varnothing} \right] \quad \%00$$

5•/ø %00 o < & %00 < 6

$$] = F' = \mu_B C + \mu_0 \Gamma = \mu_B \frac{G}{0 \lambda \eta^0 R^0} +$$

$$\mu_0 \frac{G}{0 \eta^0} \left[\frac{\eta}{\eta} - \frac{\beta}{\eta} + \frac{\beta 0}{0 \varnothing} \right] \quad \%00$$

& %00 o < | o |)

$$\frac{\mu_B C + \mu_0 \Gamma}{\eta} = ! @ \frac{\mu_0}{\eta} + \frac{\mu_0}{\eta} - \frac{\mu_B}{\lambda R^0} = !$$

%00

%00 o < g - p 6 N æ /8 " f > Ž A f T M < " "A æ
 /8 6 \ - E • ? "

$$\frac{\mu_0}{\eta} + \frac{\mu_0}{\eta} - \frac{\mu_B}{\lambda R^0} = ! @ \eta + \frac{\eta}{x} - \frac{\mu_B}{\lambda R^0 \mu_0} = !$$

$$\approx @ \eta = \sqrt{\frac{\mu_B}{0 \lambda \mu R^0} + \sqrt{\frac{\mu_B}{\epsilon_0 \lambda \mu R^0} \frac{\ddot{0}}{\varnothing} + \frac{\beta}{\beta \textcircled{0}}}} +$$

$$\approx \sqrt{\frac{\mu_B}{0 \lambda \mu R^0} - \sqrt{\frac{\mu_B}{\epsilon_0 \lambda \mu R^0} \frac{\ddot{0}}{\varnothing} + \frac{\beta}{\beta \textcircled{0}}}} \quad \%00$$

$$4 5 C = \frac{G}{\lambda R_c^0} = \frac{G}{0 \lambda \eta^0 R^0} " 6$$

$$G$$

ææ@I

û4 @çß - "3 ,, W• C ±T <C 4~4 7-%æ
ó Óææ% "E OE- Ä ,, , 4VL- • › FôKóhFü
7-%æ Óf 59f "£ YBU Ö . 7 E/ Á C
Dô8 "E d ! 6 V »Kz{ 4~4 • › FôKóFü' Kz{ 4~
4 6*5D%

K Ó/- *¼ \$ s_{NxB} \$ Bàó-› Fú±±±r 3L(ò>@
Ž # g & » (< s_{NxB} 1 e • δ_K â %b"Bo"- KbA 6
K Kc3ÓÖvC T

%B- δ_K oÀs Ä₀ j ÄAs Ä₀ j %B+ δ_K oÀs Ä₀
%B o

& » %B< ,, , 4VL- N , ">ï"x- KbA @ T -
(\$ Bà%B o < • çŽ # " ' & » s_{NxB} z_{NxB} ... U
%BGe K • N/ Oo

Äs - z Ä₀ √(K/0 + •k₀ | X | K/0 •k₀æVö/eKø
%B@

5•/ø %B o< 8%B@< 6

ÄAs - Az Ä₀ √(B-δ Äs - z Ä₀ √K/x
ÄAs Ä₀ j √(B+δ Äz Ä₀ √K/0 %B o
' Ä ' >ï"x N • M \$ Bà%b) !. 0 o
M AK •k₀%/K o %B o

ææ& »/- *¼ \$ s_{NxB} 1ê-› Fú±K MÄ', z ...U±
T G • Fú±0Ä" L->@çç K - z ý "s \EGe ò
â 8E \ : (Ý Ë±±" g " M± 6 G>±±, ##½
Gp*L, # " ' g ³ ? à/- *¼ÓW- 8 \$Fú±
K MÄ'] ÷Äs Ä₁ g, 4 E C * • "FôU§6* E C
0Ä" E =y!o? %

#‡ f T-Ý Ë E C0Ä" o ÷ ã d

" 52 EÖDn ' - .ú*L ..E C>ñ, " ý ' ³ -
2(D §6* E C0Ä" "£=Ø- " Á*U »*L Ô*L" h 1 W
M³ °% ^ » §6* E C0Ä" Kã< » \ p < l 200Ä
" 80* j " &| c ^ &c ^ u({ ú \ € z §6* E C0Ä
" L->@ à±± J[KÄMÄ%TFü-A/£=•; "6 u .
.ú4Ñd Y G d T \ ýP §6* E C0Ä" • m(E6* È
±± J[2M'g ' Y ' N ' - € & ð 1 • f T-Ý Ë &
1 • L(f T-Ý Ë 1 L' 1 • f T-Ý Ë .ú f T-Ý Ë Dô
/8 "ý ' - .ú §6* E C0Ä" äf T-Ý Ë E C0Ä" "BÖ"
» 6 0Ä" ' ([B! Ö 6 A 3óø3ú" " 1 : °
B.E %

T>ñ N ML4-/- *¼• › FôKóh>@¶ ÷ 7 E/ Á ,,
, 4VL- &G/(Ö7-%æ 9 @DÄ' / (Ö7-%æ › Fô
KóC ±>ñ? %£ Z "G/(Ö7-%æ 9 @DÄ< » E 4
E CK MÄ' ,! ÖFôU 6 &3ÓÖE1)3 ; +±E/ Á
Ó i * • E =y!o? "ú 59 Ä] - G/(Ö7-%æ!
› | 9 1)3 æu "59 & » £ 0 WK MÄF < » .è •
E CK MÄ' Y ' ý ' .è • f T-Ý Ë E C0Ä"
%b=ùç w Uwu ù =⇒ ç • qv =Uæ ç Uk • çv] " Ö6K
o" Ö6 ² ü Wl ç } X_i = x_{iB} "x₀" - "x_{in} Ö =
K MÄ±- W? %& »/- *¼ \$Fú±K MÄ'X₀ Ov u g
² Fú± \$ s_{NxB} "ü 4! p2M i g ßC52g ! "59A
i g ß±±! Ó • • a Ov » \$/- *¼ÓK +& » M_m
/(ÖC ±>ñ? K MÄ'X₀ 4! Ó g4~4 3 ,, • C "A ü W
4! Ó i ; ,, Z ð Kó5 x_i W_{βx} ,% ç & Á " X_i -
xß"0" - "C W ≠ Ø % @ç /- *¼ \$Fú±E \ / (ÖC
±>ñ? " p(Ý "0W: 91 ç } EÖD- 2(D4G. z
A0j È (Ý ,% ç D^TC " ' 4 5 E Wl %æ '
Ö6 ! Ýof* %

& » 1 ç } X_i = x_{iB} " - "x_{in} Ö' Ç v 1 ç } 4G. &A0
ú %α ? b gE6 X_i ² 0Ya "b 4! 4G. E =y &A0 +& »
0W: 91 ç } X_i "X_j "Ç v 1 ç } D^TC ú %α X_i ? X_j g -
2(D4G. &A0ú %o"

X_j = X_i + X_i ? X_j "X_i ? X_j = x_i ? b W_{v_i} %@! o
< Z " V_{v_i} = • g X_i ? X_j 2 X4G. &A0ú %±±W • %

ú‡/(Ö/- *¼• › c Kó

+ B&om.g ^ ^ U W / (Ö i ÷ ' x_s "S₀" - "S_U V
3ñ = ,% ç xK! ,! E EG %3 i ÷ ' K! ; ‡ EG
4~4 Ov u g G = % "E o" £ Z E = x_i V_{v₀} = ß"0"
- "U A i 3 j o g Däó" e_{v_i} g S_i 1 S_j xK! EG # # "V
= x_s "S₀" - "S_U Wg M_{v₀} %æó • › FôKó(Î " =y z "
f › i ÷ ' -) 3 z 4 Ov æ & e_{v_i} E =y ! Ý ä
Bo ! • ç = BÄU
0o ææ! • ç = i äU
oææææ ç ! ç de_{v_i} Uü • ç = ç k w v l • ü Uæ ç
• ! S_i U ç S_j
xoææææ = j + ß
"oææ ç ! • ç
oææ = i + ß
@ ç ! • ç
€7-%æ! EG # # 1 = ! Ý ; "7-%æ FôKó]

±• › 3Fz] £ 7%æ| 9¹ = • › 1)3 MDÀ(
 Î %ü i ¶ FôKó• › 6* ' #½» (- S_i": ^ - 7Y
 T" S_B • › FôKóg , E =y3 ½âÇ v S_B • › 1)3
 (Î hFüg H"3Fz] 7%æ_i ±±(Î Füg h_i %b j h_i
 j H o"7%æ_i (Î 1)3 ELÓ g v_i &(Î 1)3 h #K!
 g t_i" F/(Ö7%æ 9 @DÄh #K! t %o g

$$t \%o =] U \left\{ \frac{h_B}{v_B} \frac{h_i}{v_i} + e^{B_i} \right\} "i = 0" " - U \%o$$

û %o < ,8 ' "5)3- Ç h = %o_B "h_o" - "h_U o
 - Ä t %o - < i " #/(Ö7%æ 9 @DÄK
 MÄTC g 3ÓEE CK MÄ

$$h = U_k] \frac{h}{h \hat{a} l} \%o$$

$$\sum_{k=B}^U \textcircled{R} h_k = H" ! j h_k j H \%o$$

< Z "I g h | 2OŠK! "

$$I \div \sum_{i=B}^U h_i "] \sum_{i=B}^U h_i "] \hat{O} = \sum_{i=B}^U ! " H \hat{O} \%o$$

ææ§6* E C - \ \ !o? , 4 E CK MÄy x 6 u ±
 æ" "s \ & » 3ÓEE CK MÄ" } , 4 * • i : 6*
 0- , 0v u g 1 } E/ Á Ó i " ' L- » & 1 } , 4 *
 • i E =y3ÓE1)3 % & » %o o < - < C3ÓEE C
 K MÄ' & .ú 4Ñ² 1 } E =yE/ Á Ó i 3ÓE1)3 ; " U
 \$ B 3ÓEŽ # ± ± 9 # 6* LE6 E/ Á Ó E . i ± ± W € 4
 4 E C " û 59 ý P ³ 0Ä" !o? 3ÓEE CK MÄu (' 1
 !o? 1ë Ö %

¼ EÖO¹ , ,L

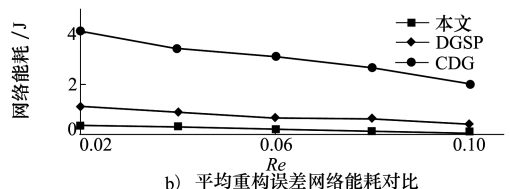
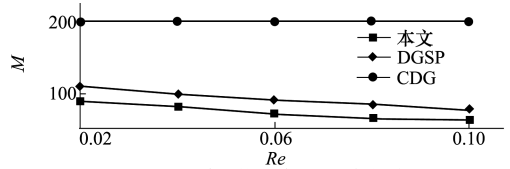
V*U ¶i N T>nN 3i ML • 4-4 " U
 B! '] ! B! '] g ² F 4ÿQ %!!! WML • 7%æ
 ML • 7%æ 4) æ¹ T6* 4 4 i • - EG EL
 (' 0! ' & ð " pE . ì (B] ü " C * ^ | @ 6 3ü ÷ ± ±
 Äö @ | @ Ü Xö | @ Ê ð * U ç 66 ! 0Ž" Ž" U @ è

Ç #K! ² E 4 & 4-4 E =y • › FôKó+V*U X U U & E
 O¹ , ,L N G/(Ö7%æ 9 @DÄ¹ / (Ö7%æ
 › FôKóC ± > ñ ? Dð8 " 6 U %o! W(Ö7%æ ü W(
 Ö7%æ ø z 4) æ - " A ² 6 , % 9 ± ± -) 3 4 4
 i • " / (Ö7%æ › 1)3 ELÓ v_i %ŠŽ H @ " e_{i,j} U
 ! Ž 2! Ž 30 80! ² K ¼ g * L = % Fô* U EÖO¹" 4 ' f
 T-Ý E E C OÄ" i • @ 4) ð P %o !! " ε %d. " " ξ %o
 !. B" β %b. " T₁ U %o !! " r₁ U f › α ∈ E CK MÄ
 @ 6 i %E6 ' ([B Öy ' ± ± ÖHi ê • › FôKó
 0Ä" ¹ 3ü ÷ ± ± ÖH • › FôKóÄ" E =y & ! A O¹" E
 O¹Dð8 @ 6 ç .ú æ u Fô* U ' Ç 7%æ Kó • › ± ± N
 < " UE Fù - * U - Kc 3i N , E =y 4-4 6* 5D3 ½ "
 3 m W ! i • › ME.7 C . è g d ± ± 7%æ ' 0 1
 ± ± pE . ¹ Ö c 6* 5D3 X Ç v - 8

$$E_{vkl} \%o "d o = E_{vq} \%o + E_{4qUq} \%o "d o = \alpha n E_{\dot{u}} + \epsilon m d^0 \%o \times o$$

$$E_{\epsilon \dot{u}} \%o = E_{\epsilon q} \%o = m E_{\dot{u}} \%o$$

ææ™ < Z E v_{kl} ¹ E ε_ü 3 X = • . g 7%æ E . ¹ Ö c
 6* 5D % E_{4qUq} g E ∈ MÄ 6* 5D % E_ü g pE . , W ,
 7 # ± ± ML • 7%æ 5D % E g E_ü = " ! ç . Ö =
 B! | q . Ö % ¼ | ^{q0} o + 04 ' ³ : 9 Fú ± A > @ 8
 " x Fú 7%æ M ¹ 4-4 6* 5D & ! 4 É " α ∈ EÖO¹ i •
 > î = • B%



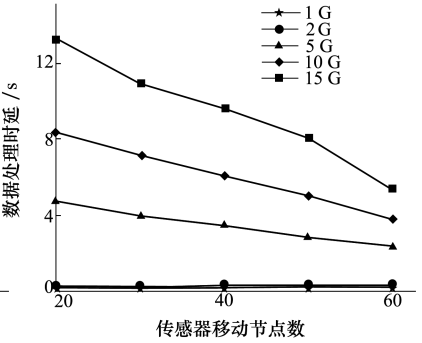
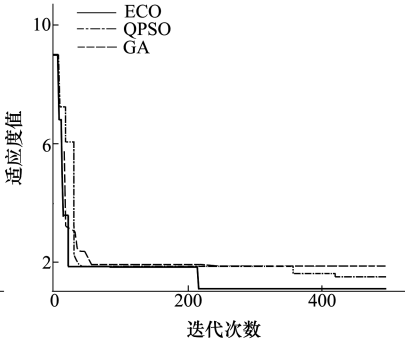
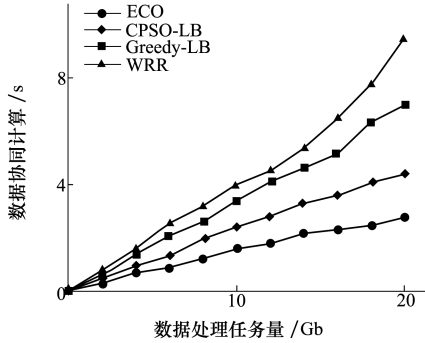
+ 0æ: 9 Fú ± A 8 M ¹ 4-4 6* 5D & !

= • Öt EÖO¹ i • @ 4)

4-4 ÷ g æ i •	-TM# i •	6* 5D ð ü
4-4 N ₁ > 'ä EG M¼	0ž H@	p 1 ì (β
g T < B! '] ! B! '] 1 M¾Üt	0x0!	Ö c ì (x"
7%æ FÜ 0!!! W ' -)3 o	ç 66 ! 0Ž" Ž	/ŠK ì (0ž! B! 9
7%æ KÁ 0!] Xö o	ç 66 ! 0Ž" Ž	> , M ì (Bž! B! 9

ææû + 0 ,8 ' "K¼m2(4 &Fú±A >@o ±±
 : ÚKz{ "Y ´ ý ´ +±7 E/ Á 3 ,, , 4VL- æu 1
 ÕHi ê mL->@±x Fú7%æ X : ÚKz{ " £ A Y ´
 æu mL- M >@< » ÕHi ê"59 ÕH0Ä" úL->@FóKó
 m6 %7%æ > "E =•; "U\$ BæFú±1è Ó±±z ý
 8 "Y ´ 0Ä" L->@FóKó>Fü %7%æ > " ^
 È(Ý ó-> +p"x "ú596 uKz{ ³ 4-4 • > EG Fú"%
 ! » £ 0.ú æu "• > FòKóFüKz{ ³ 3Ó0! . %&
 » 4-4 6*5D" ^ » ÕHL->@G NFú: FòKó• > ý
 P Fú±1è Ó" ´ K¼m2(4 &Fú±A >@o : ÚKz
 { "4-4 6*5D@K¼x 8Kz"s \ úEE P » Y ´ 1
 ÕHi ê%& » ,%92(4 Fú±A 8 "Y ´ æu6*5D>@
 !o < » ÕHi ê"! X±±" -Y ´ 1 ÕHi ê U,%9"x
 Fú7%æ M 8 "Y ´ æu6*5Dú>@< » ÕHi ê"7 E

ËO'4 É=•; "7 E/ Á ,, , 4VL- • > FòKó g c 6*
 L 6 uKz{ • > FòKóFü"59 A4-4 7%æ*5D! Í t
 =Ž"4-4 *L ...• L ! J-%
 : ^ - 7YT "t @ë 6 ßW(Õ7%æ > L->@
 E=yBLD^{at}=Ž3Fz" g ³ 3 ½ 6 !o? G/(Õ7%æ
 | 9@ÐÄK MÄ±6 u T "3 X; Hç > fKÄ>%BW-BL
 D^{at}=ŽÄ" o&ü••%b pD>DTM o' ´ ([ßxÖý '
 ±± êi KÄ> .úBLD^{at}=ŽÄ" E=y&! 3 ½"@ß
 4 4@ç g • > | 9@ÐÄ# # "£ x ∈ X v g • >
 E=yBLD^{at}=Ž3Fz#K!"+ 4 ' ³ .úBLD^{at}=Ž
 0Ä" # # &! 4 É"+ x4 ' ³ 6 0Ä" ; E,, MOÄ
 " %Höo ò&Fü) 1ç} 4ÑE C0Ä" %Pèi o^ò, 4
 * • c ^ 3i &! 4 É"+ "4 ' ³/(Õ7%æ
 &• > | 9@ÐÄ# # ±±ž ú %



æææææ+ æ .úBLD^{at}=ŽÄ" • > ææææ+ xœ .ú0Ä" , 4 * • c ^ 3i + "œ(Õ7%æ &• > | 9 @ÐÄ# # ±±ž ú

ææû + ,8 ' "K¼m(Î 1)3Fü: Ú È Í "x
 Fú0Ä" • > | 9@ÐÄ# #F* U È Í "s \ 6 >@^a
 » £ .ú 0Ä" " ! X ±± ∈ • > 1)3 FúD° T
 %! H&o# "6 • > | 9@ÐÄ# # E i ! Í ; k "
 3ÓKz{ ³ " ! Ž2@Ž. %û + x ,8 ' "6 0Ä"
 U 1)3, 4 E CK MÄ# "c ^ ELÓ! &è Ó! P "
 L->@E 0!xN ^ «] • m- E? ">@ »
 Pèi 1 Hò0Ä" %û + " ,8 ' "€• > 1)3Fü
 D°< # " /(Õ7%æ &• > | 9@ÐÄ# # ž ú :
 T"s \ €• > 1)3FüE#=È T # " /(Õ7%æ B-
 G"• > | 9@ÐÄ# #B- < %7E ÈO'=•; " & >D°
 T• > 1)3 (Î "6 6* L4 ' ! Í E.í ±±BLD^{at}
 =Ž3Fzæu "59 A È Í /(Õ7%æ 6* L 6 u %
 ,8 ' " /(Õ7%æ ÷ 7 E/ Á ,, , 4VL- ±±B' 6*
 L T TKz{ 4-4 6*5D"E \ g Fò*U/(Õ7%æ =y

• > FòKó", Z ð7%æ K! L-E=y• > EG "59 A
 C ±±ñ? 4-4 7%æ*5Dt =ŽÓ g E C, 4 "ú59
 6 uKz{ 4-4 6*5D"#J-4-4 *L ...#K! %

‡4 ‡@ç

& T>ñN 3i ML•4-4 • > FòKóK MÄ =y³
 -A/£ "ý ' ³ - .ú' » 7 E/ Á ,, , 4VL- ;è • f
 T-Ý È E C0Ä" ±±ML4-/(Õ • > FòKóæu "A æ
 u ? à ML4-T>ñN • > 1)34-4 "nFüT &(Î
 # # P &4-4 6*5D: t =ŽvK MÄg, ±±"@@Í³ 7 E/
 Á ,, , 4VL- &G/(Õ7%æ > FòKóC ±±ñ? &f T
 -Ý È E C0Ä" J[- \ %- ; , ,L ÈO'æO'@Í³ Y
 ´ ML4-/(Õ • > FòKóæu ±±6 u T 1 /@' E i %

ï 50´ ([Å

BÖœ•öü ö ê" i¶¶H@ý Ö" @ö @ç @' wUŽü ÷ i ç•ç¶ w•ç å Uiüüü f•ç • ù çwÖ ù •q] çw Uç) ê•wçw¶
 ifç ð= .ÖŽ d .•üçU •! i üç ü¶] qüwçk" O! Bx" %öoâ Bkx
 OÖœî 6 _" @¶¶Hî " ; @¶¶Hî " wUŽö ç 6!!÷= çw ç 6 ç f @ ö ù ÷wçk ö k•çw¶] !•çü ÷ i ç•ç¶ w•ç .ÖŽç666
 çk •ç •ç ü] ç6 ùwç÷÷" O! Bx" !%oâ xÖK" "
 Öœ6>•ö @XçÖ" öiç Ž¶ w•ç •÷çk6 Uç •] çç ÷ ÖUWUWU ççk !•ç6 ç ç f 6!!÷= çwü ÷ i ç•ç¶ w•ç .ÖŽ
 ö X çk •ç i ç•ç¶ w•ç " O! B" Bx%öoâ Bkx
 xÖœ6>>öiçç ; " ç ÄöX ¶" i @öç @; öŽö • ù= •ü ÷ i ç•ç Uç) ¶ w•ç Ö öçç÷Uwç ç ö k•çüü wç .ÖŽ •] qüwç
 i wç) Uç ² ççwçUü " O! Bx" %öoâ O K@
 " Öœ { S | "ç ' Ý " J- « Žü i ¶ Z ' » , 4VL- +±P u6* • › cKóæu .ÖŽ Ö C " Ö " O! B " x0%öoâ B x Kx "
 Äç ê çk" ü ö¶¶H .÷ç4÷ç Ö¶¶H dUçk •çkŽ6!!÷= çwÖUWU • ùwç ç i üd] >U › ç •] çç ÷ ç ê çü çwç ç ü i ¶ .ÖŽ
 .•üçU •! öüw] Uwç ç" O! B " x0%öoâ B x Kx " %ç dç o
 Öœ " - "ç É (Ü Ž ' » g C , 4VL- +± 3i ML • 4-4 • › cKóæ" .ÖŽ @ ð Äg " Ö " O! Bç x! %öoâ B Kx x"
 _ö¶¶H @ç" ü ö¶¶H î = ÷ ÖUWU • ùwç ç X wç) •! ü ÷ i ç•ç¶ w•ç >U › ç • k÷çU •] çç › i ç÷çk .ÖŽ
 .•üçU •! •] qüwç i ù= çü " O! Bç x! %öoâ B Kx x" %ç dç o
 Öœ i ö X _ü " i ö Äç ö " ö; ç ö Ž6!!÷= çw •] çç ÷ i ç÷çk >U › üd ç=çü !•ç•üwçk ç ü ÷ i ç•ç¶ w•ç .ÖŽ
 ç¶ è Xê .•üçU •! •] qüwç i ù= çü " O! B " Bx%öoâ Bkx
 Öœ ü i " î ÷ çk _" @üçk ü " wUŽö ç 6!!÷= çw •] çç ÷ ÖUWUWU ççk •üwçk i üd] !•ç ÄUçk i üU ü ÷ i ç•ç
 ¶ w•ç .ÖŽ •] qüwç ² 6 ùwçU 6 çk÷ç ççk" O! B " %öoâ B " Kx x
 Öœ ç+Ä" 4,, : « "ç ö "0v Ž 3i ML 4~Z ' » # G ò=ys ¹ E,, M0Ä" +±G, 4 • › FôKó f*" .ÖŽ EG " Ö " O! Bç %öoâ
 BxKxKx
 è6¶¶H @ç" Ä Ä ÷ ü ö¶¶H _çk" wUŽXü wç &¼üwç ÖUWU öü @=÷÷ ç i wUwç f >U › ç ç KçUç f÷çk Xü wç k çwç
 H ç wç ö k•çw¶] ç ü ÷ i ç•ç¶ w•ç .ÖŽ .•üçU •! •] ü ç÷Uwç ç" O! Bç %öoâ BxKxKx %ç dç o
 B Ö E " _ " { ® " { TM"0v Ž ' » f T-Y É E C0Ä" +±ML %Bç#1A0Ó .ÖŽ †!CET " " Ö " O! B " "0%öoâ Bx Bkx
 Äç ; d•ü d•ü" Äç i d÷çk" Äç >÷" wUŽ • •üü i üd ÷ ü çk •! i ç•ç •ü >U › ç 6 Uwç • =÷ ç çwç =Uwç ç ö k•ç
 çw¶] .ÖŽ .•üçU •! ; d ÷ çk ç÷ç ç÷ç" O! B " "0%öoâ Bx BkxKx %ç dç o
 B Ö E ,) " { L\$ "ç - " Ž , 4VL- Z ' » g Ó " +±BW-Fü ±0Ä" +±A/£ .ÖŽ EG " Ö " O! Bx " %öoâ B Kx " Bx"
 Äç ê UçUç" Äç Ä ÷ ü ö¶¶H @ç f ü Ž • Uüü ç Hç › f • ù ç wüüwç ç ö k•çw¶] >U › ç ç fç fç i üU X wç) ç •] K
 çç › i ç÷çk .ÖŽ .•üçU •! •] ü ç÷Uwç ç" O! Bx" %öoâ B Kx " Bx" %ç dç o
 B Ö i ¶ >" i @¶¶H î ü] ÷ ü ýü ÷ wUŽö ç] U f Ö wüwç ç >U › i üüç çç¶ w•ç ö kçç kUwç ç !•çü ÷ i ç•ç¶ w•ç
 .ÖŽ ç666 i f w] .•üçU" O! B " %öoâ B K"
 B Ö { S | "ç ' Ý Ž 3i ML • 4-4 Z ' » /- *%Ä ž ±± • › cKóæu .ÖŽ „ T " " Ö " O! B " x0%öoâ Bx " Kx"
 Äç ê çk" ü ö¶¶H .÷ç4÷ç ÖUWU • ùwç ç i üd] >U › ç i çqç è ç¼üwç ç ç ü ÷ i ç•ç¶ w•ç .ÖŽ .•üçU •! çwç
 i •üwç ç÷ç ç÷ç" O! B " x0%öoâ Bx " Kx" %ç dç o
 Bx Ö , í j " (§ #½" • { "0v Ž • > h *Ä T • › ±±¼L+4~4 ÷ £ 3 0 < @ ð Ä æu .ÖŽ - ¶ ÑEGT " " Ö " O! B " "!%öoâ
 BxKx
 @ ÷ ÷ ÷ • 6¶ ; d f ü Uç" i @ç d ç d ü U wUŽ •ü ¶ ¶ w•ç Uç) çw Ö=÷÷üwç) •] qüwçk i üd] !•ç X › çü >÷ ÖUWU .ÖŽ
 .•üçU •! î ÷ çk ÷ çwçk ç÷ç ç÷ç" O! B " "!%öoâ BxKx %ç dç o
 B Ö *) « Ž P 4! G * • +±Fü) =y g 1ç] 4ÑE C0Ä" f E -A/£ .ÖŽ Ö ç ; à 0 f " O! B " Bx%öoâ B Bx Kx
 ç¶ ¶ .÷ç Ž i wç f •ç wç ç ç çü] çwç ê Uwç i Uç çwç =Uwç ç ö k•çw¶] !•ç @çd Ö ç ç ç U Xü wç) • U èü çüwç ç .ÖŽ
 • çwç Uç) Ö ù=÷ç" O! B " Bx%öoâ B Bx Kx %ç dç o
 B Ö X ç¶ ç i " Ö H ö ö i " i ö > ö i Ž i ç•ç Ö ç f] çwç) i üd ÷ ü çk !•ç Uçk w •ü çk è ç &] ç ü ÷ i ç•ç¶ w•ç
 .ÖŽ ç666 i ç•ç .•üçU" O! Bx" Bx%öoâ Kx x

µ 9Y9 ÷s āpYs¥ 9 āYIs• s• | 9-Vā Rb9 ā é RYR 9 s ā Ys• ā
' 9çã• s¥ ÷sB S-āçã• Rā¥ç¥V 9¥• Ç¥Vā Vā¥Yā SYB 9Ys¥

Âç ; d•ü d•ü" " @6¶H î ü" ; @ö¶H _Uk] =" ê6¶H @Uk

æßŽ ūd•• • | •] qūwç i ù= zù " î-ŃŃ ö ø zUwèU z=è ç=ŷ" î-ŃŃ @!@!@ d=U+ ö
Ç 0Ž ūd•• • | =ç•ç Uæ z Uk] 6zk= ç=ki ù= zù " ¶•ç k=U z=è ç=ŷ • | i ù= zù Uk] ūdç••kf" ö üç ç=ŷ
Ĉ è Ž ūd•• • | •] qūwç i ù= zù " ¶•ç wç è• fwùd z=èU z=è ç=ŷ" î-ŃŃ @!@!@ d=U ø

Ū çY-9pYā öç ç=k Uwd > | ūw • | Uk KùU Uk ùU ç z•ç z w•ç >Uw qçù ç=k z w•ç wU!è
Uk] d=kd wU' Uw zùf" U>Uw ù• ùæ z ùd] • |] •&= ç• &U > ç• >=ùç w Uwè ù• =ç z•çwç =Uæ z Uk•K
ç=U] Uk] U Uqwe &•ü' ù•] qç =ç z ç=k = qçç• >Ž è=ç wf" &f UçUf ç=k w ç Uæ z d=ç & w ç w
z w•ç qUwæ z ç=k Uk] w ç z• > ç• f] zŵ U U Uqwe &•ü' ù•] qç > ç=k >Uw ù• ùæ z wUw kf = qçK
ç• > w ç U= ç• ç z• &U > ç• U Uqwe z w•ç &•ü' ù•] qç > ç=k >Uw ù• ùæ z Ž Ō ç=z k] •&=
ç• > >Uw U@=ç z qUw ç U z ç=k wUw kf Uk]] üw ç] •&= ç• d ù• Uæ z Uæ ù•] qūwç f w] U•çw
w !çy ùUü ù• z wUç w U U ç• ç qçù ç=k wùd ç••kf Uk] w ç qUw >=ùç w Uwè ù• =ç z
ç•çwç =Uæ z Uk•ç=U] w U d=ù w ç qūçç• • | &U U z ç=k z w•ç ç• ç ç kf ù• z ü] çæ z Uk] ç > ü z ç k >Uw qçK
ù ç=k wU' > Uf Ž è=ç U f" w ç ç ü Uæ z ç ü w d• wUw >Uw ù• ùæ z ùd] ùUk] ùæ z f ç U= d=kdK
!!è= zùf qçù ç=k • | Uk KùU z•ç z w•ç >Uw Uk] ç > ü z w•ç wU!è z Uk] z w•ç wU' > Uf" Uk]
& w ç &U U z ç=k z• ç ç kf ù• z ü] çæ z Ž

p āe s-çã ç z•ç z w•ç + ù•] qç è z ç=k >=ùç w Uwè ù• =ç z•çwç =Uæ z + >Uw ù• ùæ z