

The logo for TrinaTracker, featuring the word "Trina" in white with a red dot above the 'i', followed by "Tracker" in white. The background is a blue gradient with a red bar at the top.

TrinaTracker

The title "Trina Smart Tracking Technology" in white text, centered on a blue background. The background features a grid of white lines and a network of nodes.

Trina Smart
Tracking
Technology

A 3D rendering of solar panels in a field, with a blue and green color scheme. The panels are arranged in rows and are slightly tilted.

3D rendering of solar panels
a 3D rendering of solar panels

The logo for SunerTrack, featuring the word "Suner" in white and "Track" in red. The background is a blue gradient with a red bar at the top.

SunerTrack

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;` fcbVgUf[a`

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3. Definition and Main Value Points of SuperTrack

4. Introduction of SuperTrack Algorithm

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i WsfZWd

&\$ 4SU] fdSU [` Y S` Y^Wabf[_ [l Sf[a` E 4 3 XadUa_ b^W fWddS[

5. SuperTrack System Architecture

6. Test Data and Gain Simulation

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(\$ 9S[bafW f[S^Wef[_ Sf[a` S` V fZ [dVZbSdfk hWd[X[USf[a`

7. Conclusions

1 Abstract

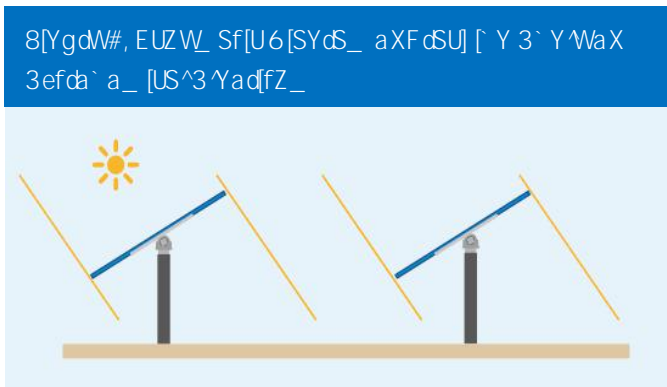
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fWUZ` a`āYk [_ bcahW_ W f- ? SfVd[S^Uaef ZSe` a fdW V fa Ya Vai ` i SdV S` V fZWdW[e
VhW S dVTag` V fdW V aUSe[a` S^kž 3^fZaeWXSUfade VVfVd_ [Wē fZW_ badfS` UWaX
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aXfōSU] Wē i adVi [VWZSe TWW `ai Wd fZS` fZSf aX Xj] VW efdgUfgdWē e[UWfZWeWUa` V
ZS`XaX\$" \$" ž

3 fZagYZ fZWbWdXad_ S` UWaX fōSU] [Y ekefW_ fZSf geWē Ua` hW f[a` S^fōSU] [Y
SYad[fZ_ ZSe TWW [_ bcahWf [adVd fa [UdMSeWfZWSVSbfST [f`k aXfōSU] [Y ekefW_
fa g` VhW fVdS[t [_ bcahWfZWbai WdYW WdSf[a` g` VVdV[XXWdW f i WdSfZVdUa` V[f[a` et
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2 Background

2.1 Introduction of conventional tracking algorithm



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FZW Ua` hW f[a` S^ f dSU] [Y
 S`Yad[fZ_ Ua` e[efe aX fZW
 Sefcb` a_ [US^S`Yad[fZ_ S` V fZW
 TSU] f dSU] [Y S`Yad[fZ_ ž FZW
 eUZW_ W [e UZScdSURVd[| WW Tk
 e[b`WUa` fcb` ^`a`Y[U S` V efdcb` Y
 W Y[VWd[Y b dSUF[UST[|fkt| ea

fZSf [f [ei [VWk geW [fZWZad| a` fS^e[Y`WSj [e f dSU] [Y ekefW_ ž

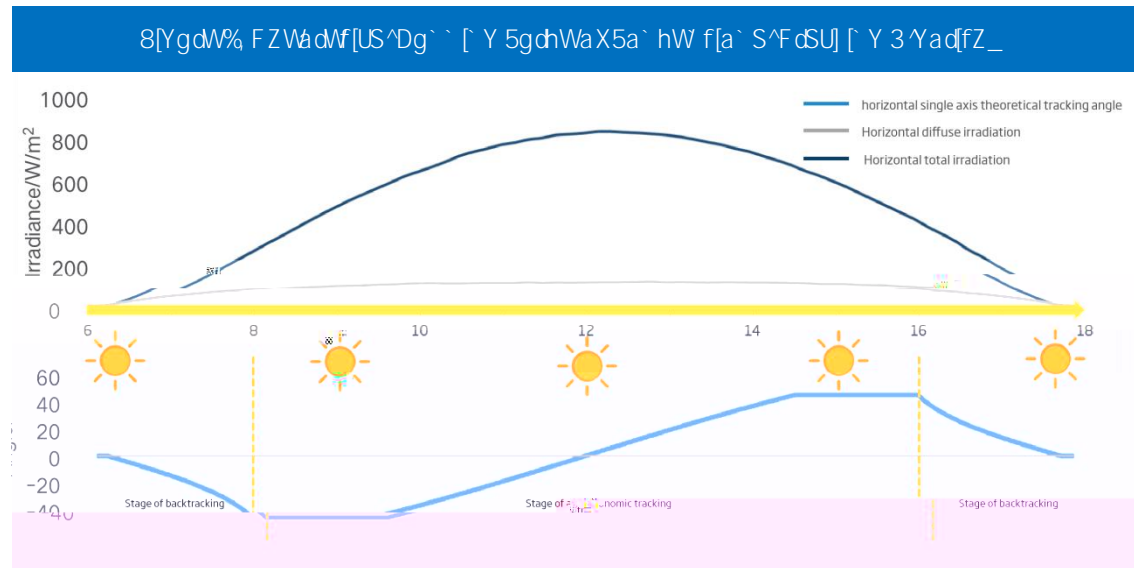
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 [U[VW f ea`SddSkef fZWZ [YZWd fZW[cdSV[S` UWdWU[hW Tk fZW_ aVg`WZ8[YgdW#fi

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 f dSU] [Y S` Y`WUS`Ug`SfWV SUUadV[Y fa Sefcb` a_ [US^S`Yad[fZ_ [e `SdYVd [i Z[UZ USeW
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 abbae[fW V[dWUf[a` aX ea`Sd _ af[a` t ea [f [e]` ai ` Se TSU] f dSU] [Y ž FZW S` Y`W aX
 TSU] f dSU] [Y US` TWaTfS[VW SUUadV[Y fa fZW[U[VW f ea`SddSkef SddSk b[fUZ S` V SddSk

Diagram illustrating the geometry of solar tracking. It shows a sun at an angle α above the horizon, with a distance d_1 between the sun and a tracking system. The system consists of a fixed base and a movable panel that can rotate around a single axis. The diagram shows the panel's position at different times of the day, illustrating how the tracking angle changes to follow the sun's path.



Diagram illustrating the geometry of solar tracking. It shows a sun at an angle α above the horizon, with a distance d_1 between the sun and a tracking system. The system consists of a fixed base and a movable panel that can rotate around a single axis. The diagram shows the panel's position at different times of the day, illustrating how the tracking angle changes to follow the sun's path.

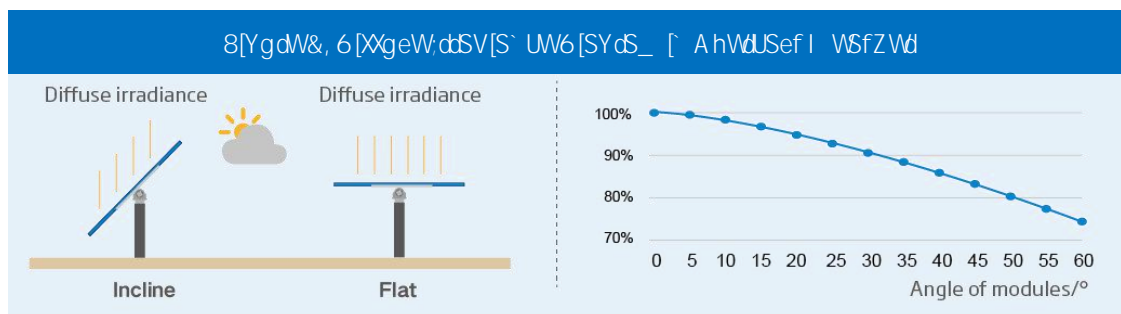


2.2 Deficiencies of conventional tracking algorithm

Diagram illustrating the geometry of solar tracking. It shows a sun at an angle α above the horizon, with a distance d_1 between the sun and a tracking system. The system consists of a fixed base and a movable panel that can rotate around a single axis. The diagram shows the panel's position at different times of the day, illustrating how the tracking angle changes to follow the sun's path.

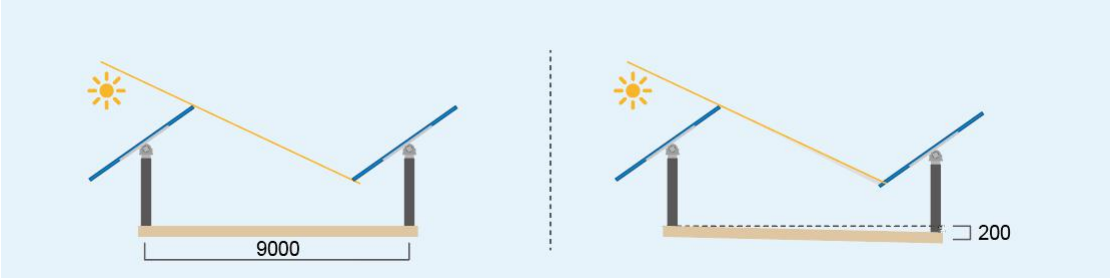
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I ZW [f Ua_ We fa fZWefSfWaXdMS^i VsfZWd Z[YZ V[dWUf [cdSV[S` UWi VsfZWd/eg` ` k VSkfi U`agVk S` V Z[YZ`k V[XgeW [cdSV[S` UWi VsfZWd/ahWdUSeF S` V dS[k VSkefi_ Sk UaZy [efl S` V fZWdWsdW_ adWahWdUSeF S` V dS[k VSke [ea_ WsdMSel SUag` f[Y Xad _ adWfZS` ' " , aXfZWi Za`WkVsdz 3UadV[Y fa e]k V[XgeW[cdSV[S` UW_ aVW[[fZW Z[YZ`k V[XgeW [cdSV[S` UW i VsfZWd Se fZW _ aVg`W S` Y`W [UdMSel fZW V[XgeW [cdSV[S` UWUSbfgdW Tk fZWXd` f e[VWaXfZW_ aVg`WYdSVgS`k VUdMSel fZWV[XgeW [cdSV[S` UWUSbfgdW Tk fZW_ aVg`Wsf Se_ S`S` Y`W[e YdMSfWdfZS` fZWfdSU] [Y S` Y`WaX Sefda` a_ [US^S^Yad[fZ_ /Se eZai ` [fZWXYgdWfi S` V fZW`sdYd fZW_ aVg`WS` Y`W[ef fZWT[YWd fZWV[XWd UW[ež 8adWj S_ b`W i ZW fZWfdSU] [Y S` Y`Wsf fZWefSYWaX Sefda` a_ [US^fdSU] [Y [e & ' »† fZW[cdSV[S` UW`aee_ Sk dMSUZ gb fa #' , Ua_ bSdW i [fZ TW[Y] Wbf X`Sfz/8[YgdW&fi



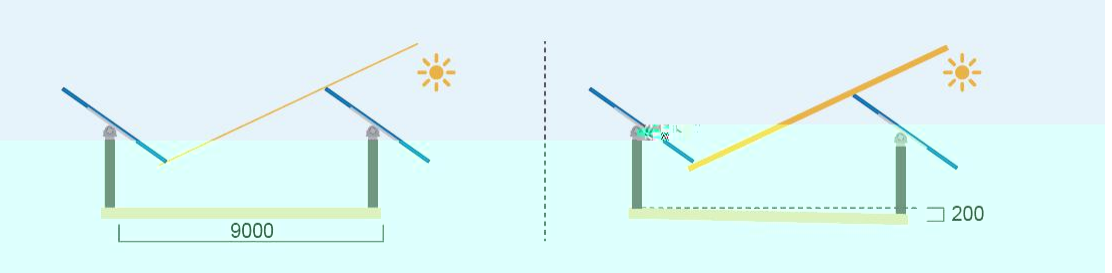
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8) YgdW(, EUZW_ Sf[U6[SYdS_ aXEZSVai e 5SgeW Tk 3 f[fgVW6 [XWdW UWTWfi WW 3dSke



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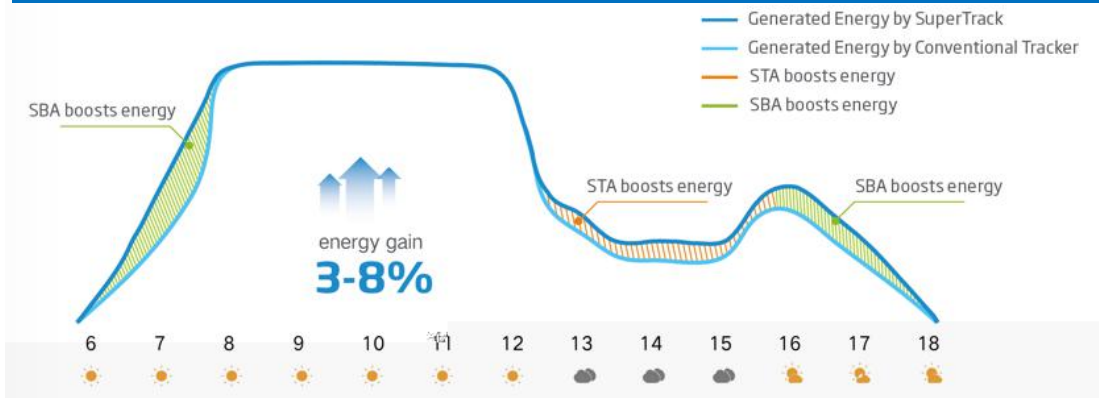
8) YgdW(, EUZW_ Sf[U6[SYdS_ aX>[YZf >W6] SYW5SgeW Tk 3 f[fgVW6 [XWdW UWTWfi WW 3dSke



3 Definition and Main Value Points of SuperTrack

FZW Ua` hW f[a` S^ f dSU] [Y S`Yad[fZ_ V[V ` af Xg`k ef[_ g`SfW fZW bafW f[S^ aX
 Zad[l a` fS^e[Y`WSj [e f dSU] Wd bai Wd YW WdSf[a` t ea Fd[SF dSU] Wd ad[Y[S`k VWhWabW
 fZWe_ Sd f dSU] [Y fWUZ` a`aYkZ EgbWd f dSU] t [U`gV[Y e_ Sd f S`Yad[fZ_ t _ g`f[ZeagdW
 VSfS S` V eaXfi SdWb`SfXad_ ž 4SeW a` fZWabf[_ S^bai Wd YW WdSf[a` bWdXad_ S` UWaX
 fZW_ aVg`W [f US` US`Ug`SfWfZWabf[_ S^bai Wd YW WdSf[a` S` Y`WaXfZWT[XSU]S^_ aVg`W
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 dai t Sha[V addWgUWTW[Y eZSVW Tk Xda` f S` V dMSdeZSVai ef S` V Xg`k V[Y fZWbai Wd
 YW WdSf[a` bafW f[S^ aX f dSU] Wd 5a_ bSdW i [fZ Ua` hW f[a` S^ f dSU] [Y S`Yad[fZ_ t fZW
 bai Wd YW WdSf[a` YS[[e SeZ[YZ Se%Z* , ž/8(YgdM) fi

8(YgdM) , EUZW_ Sf[U6[SYdS_ aX9S[7XWUf aXEgbWd f dSU] 3`Yad[fZ_



High energy yield



High adaptability



High intelligence



High stability

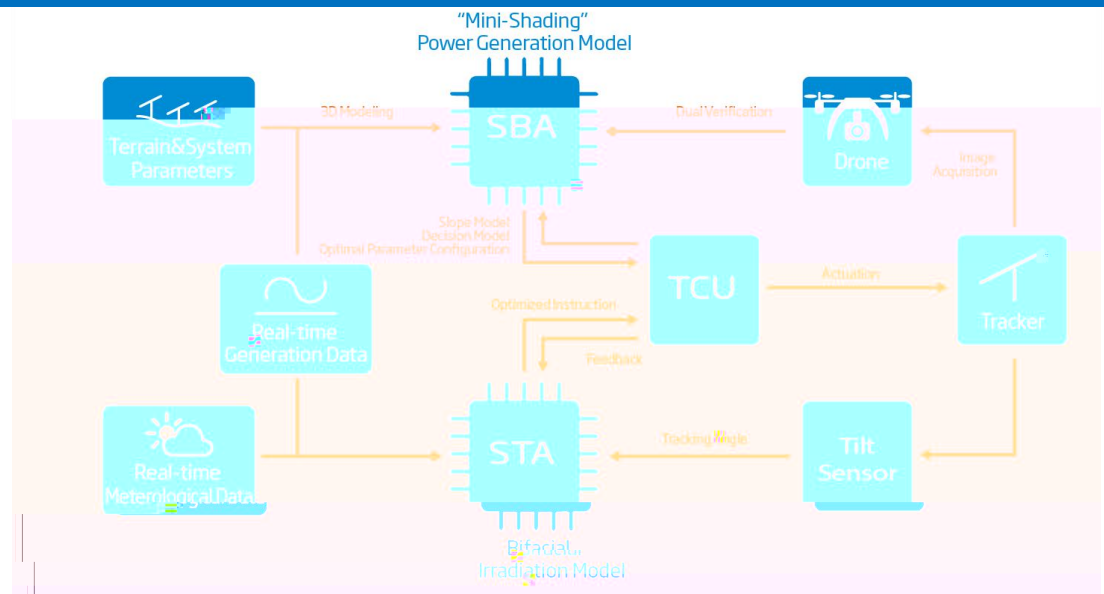
- Compared with conventional tracking algorithms, SuperTrack can increase energy generation by up to 3-8%;
- Meeting the diversified needs of customers;
- Adapting to complex terrains and various weather conditions;
- Self-perception, self-learning, self-decision making;
- Proprietary technology for the power generation model;
- Long-term test data analysis;
- Reducing the rotation of the tracker

4 Introduction of SuperTrack Algorithm

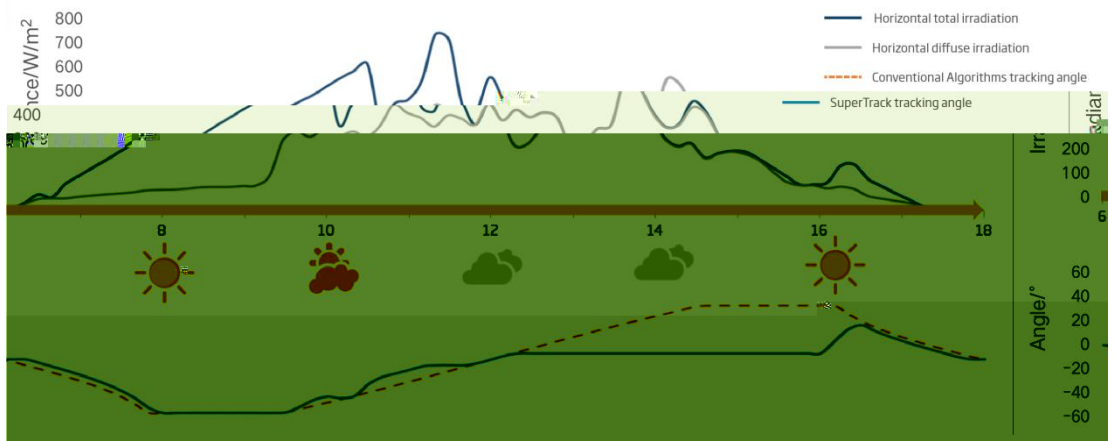
SuperTrack comprises two key algorithms:

- 1 | Smart Tracking Algorithm (STA) is used to solve the irradiance problem.
- 2 | Smart Backtracking Algorithm (SBA) is used to solve the shading problem.

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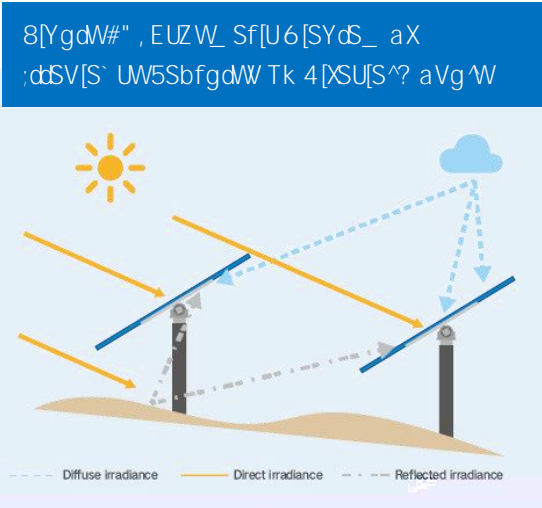


8[YgdW+, 5a` f dSef 6[SYdS_ aXF dSU] [Y 3` Y We TWfi WW EgbWf dSU] S` V 5a` hW f[a` S^ 3 YadfZ_e



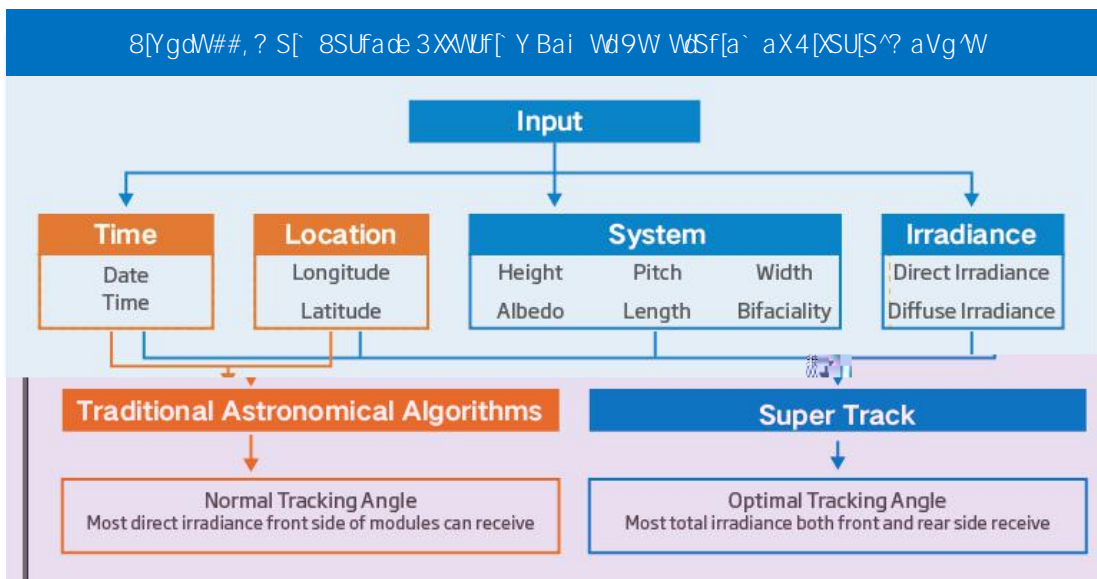
4.1 Tracking angle optimization STA for high diffuse irradiance weather

4.1.1 BIM



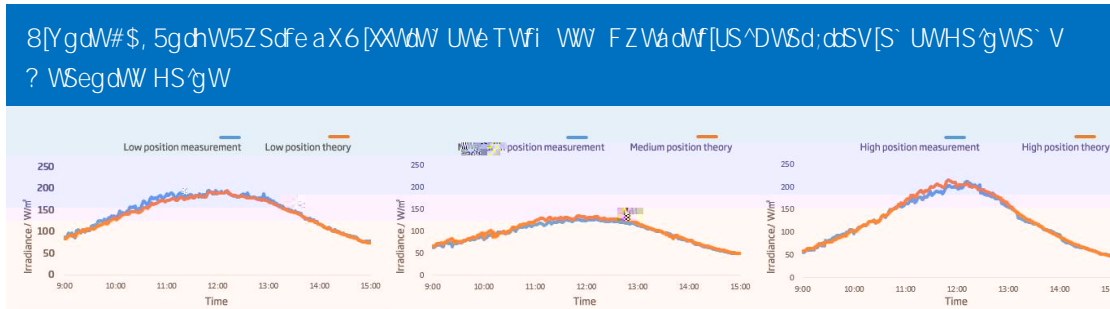
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SYad[fZ_ a` k Ua` e[VWde _ Sj [_g_ Xda` f
[dSV[S` UW i Z[WT[XSU[S^_ aVg`W` WWVe fa

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Ua` V[f[a` ezFZW4;? ad[Y[S`k VWhWabW Tk Fd[S fS] We [fa Xg`^SUUag` f # \$] WK XSUfadet
US`Ug`SfVe Xda` f V[dWUF [dSV[S` UW V[XXgeW [dSV[S` UW dVXWUFW [dSV[S` UW S` V dVsd
dVXWUFW [dSV[S` UW S` V V[XXgeW [dSV[S` UW S` V X[S`k YWfe fZWfafS^ [dSV[S` UW aX
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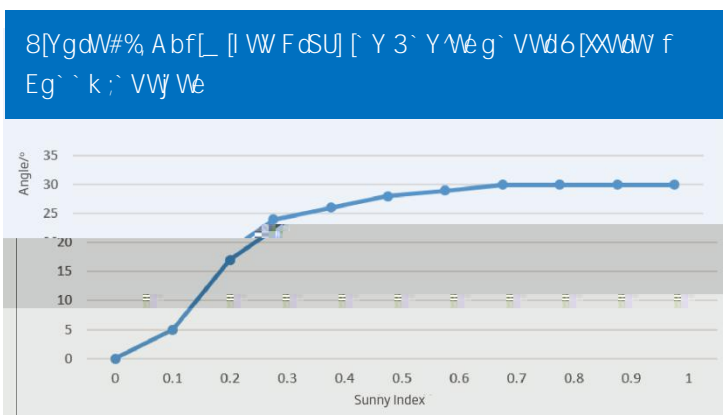


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4.1.2 Tracking angle optimization for high diffuse weather

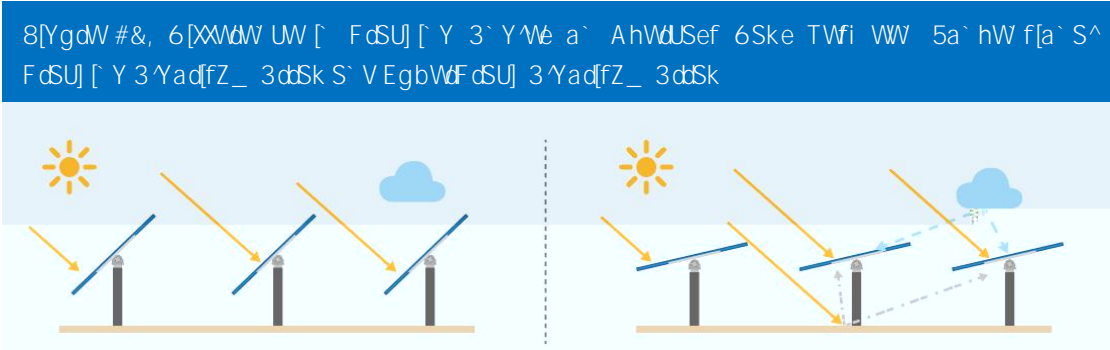


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 g` VVd V[XXWdW f i VsfZWd
 efSfVéž EbWU[X[US^k† eg` ` k
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 fZWZ[YZVdfZWeg` ` k [VVj

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 Sgfg_ [5ZS` YI Zag† SeeZai ` [fZW[XYgdW#%† fZWsefda` a_ [US^fdSU [Y S` Y`W[e% »ž
 :XfZWeg` ` k [VVj [e Z[YZVd fZWsefda` a_ [US^S` Y`WeZS^TWgeWž:XfZWeg` ` k [VVj [e
 `ai Vd egUZ Se " ž† fZW_ Sj [_ g_ fdSU [Y S` Y`W aXfafS^[dSV[S` UW[e #] »ž:XfZWeg` ` k
 [VVj [e Vj fdW_ Wk `ai † [VždS[k VSkel fZWfZWdW[UfW[US^fdSU [Y S` Y`W[e" »† S` V fZWfafS^
 [dSV[S` UWdVdSUZVé fZW_ Sj [_ g_ ž

EgbWdF dSU] e_ Sdf fdSU] [Y S'Yad[fZ_ dV[Ve a` fZWbdabqVfSck fWUZ` a`aYk aX4;?
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 Vj bWd[W UW WefST [eZW bai WdYW WdSf[a` _aVW`Xad_ g`f[ZV_ W e[a` S^S` S`ke[e] S` V
 Xgd fZWdabf[_ [I W fZWfdSU] [Y S` Y`W egUZ Se b`SU[Y Sf S e_ S^S` Y`Wa` ahWdUSef VSke[e
 ea Se fa W egdWfZWabf[_ S^a` YžfWd_ bai WdYW WdSf[a` aXfZW_ aVg`Wdž

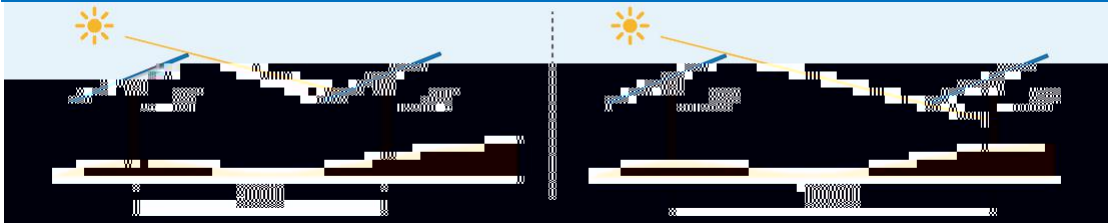


3f fZW eS_ Wf_ W [Z[YZ`k V[XXgeW i WsfZWd EF3 US` aTh[agek dWgUW fZW
 dafSf[a` Uag` f S` V S` Y`WaX fZWefdgUfgdWd S` V Vj fW V fZWgeWk g`XWax_ afade S` V
 efdgUfgdWdž FZWZ[YZ V[XXgeWsdWSe] egUZ Se 5ZS` YI Zag† ZShWfkb[US^ahWdUSef VSkež3e
 eZai ` [fZWfST`W#† Ua_ bSdW i [fZ Ua` hW f[a` S^fdSU] [Y S'Yad[fZ_ † EgbWdF dSU] US`
 dWgUW fZW dafSf[a` S` Y`W S` V Uag` f Tk *` . † [i Z[UZ USeW fZW S` `gS^ ShWdSYW
 dafSf[a` S` Y`WUS` TWdWgUW Tk STagf #) . † S` V fZW dafSf[a` Uag` f US` TWdWgUW Tk
 STagf \$* . ž

| FST`W#, 5a` bSd[ea` TWfi WW 5a` hW f[a` S^3`Yad[fZ_ S` V EgbWdF dSU] [DafSf[a` 3` Y`WS` V 5ag` f a` Fkb[US^AhWdUSef 6Ske | | | | |
|--|---------|-----------------|------|--------|
| 5a` hW f[a` S^fFSU] [Y 3`Yad[fZ_ | | EgbWdF dSU] | | |
| DafSf[a` 3` Y`W | \$" " » | DafSf[a` 3` Y`W | &" » | ž* " . |
| DafSf[a` 5ag` f | \$" " | DafSf[a` 5ag` f | &" | ž* " . |

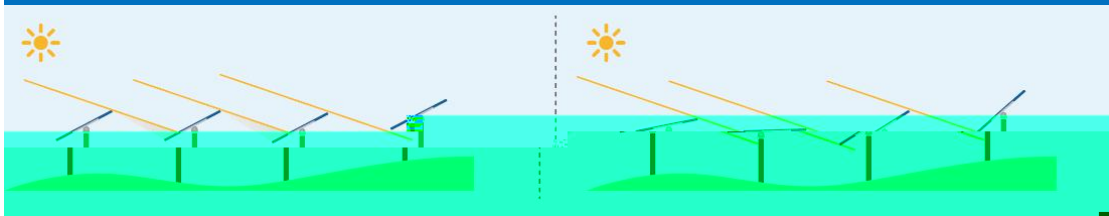
4.2 SBA, backtracking angle optimization for complex terrain

8[YgdW#', 3ha[V dai ŽfaŽdai eZSV[Y Tk 7' ^SdY[Y 3dSk B[fUZ

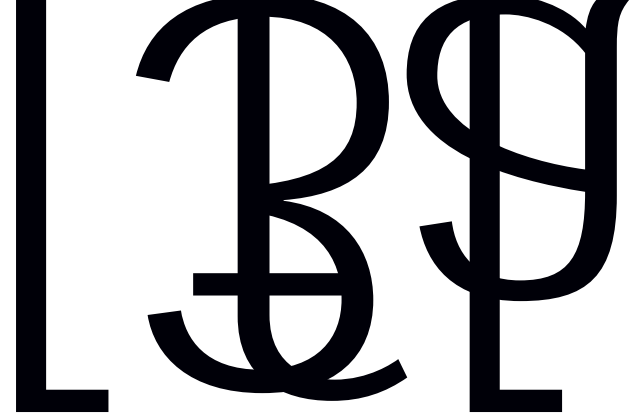


3e eZai ` [8[YgdW #' t [f [e baee[T W fa Ua_ bW eSfW Xad fZW VWX[U[W Uk aX
 Ua` hW f[a` S^TSU] fdSU] [Y SYad[fZ_ e Tk [UdMSe[Y fZW SdSk ebSU[Y fZW adWf[US^k t
 Tgf [SUfgS^bda WUfel fZWSdSk ebSU[Y dW_ S[e TSe[US^k fZWeS_ W i Z[WfZWZ WYZf
 V[XWdW UW TWfi VW SdSke hSdVef S` V SXFwd Sbbcbq[SfWk [UdMSe[Y fZW ebSU[Y t
 ea_ WaXfZWSdSke i [^ef[^TW eZSVW t i Z[W ea_ WSdSke ZShW^YZf W S] SYW? adVahWd
 Xda_ fZW bWdebWUf[hWaX` S` V Uaefl fZWea`gf[a` aXSV`gef[Y fZW TSU] fdSU] [Y S` Y WaX
 W SUZ dai [e aXZ[YZWdSbb^UST[f k z

8[YgdW#(, 6[SYd_ aXE43 aXEgbWf dSU]

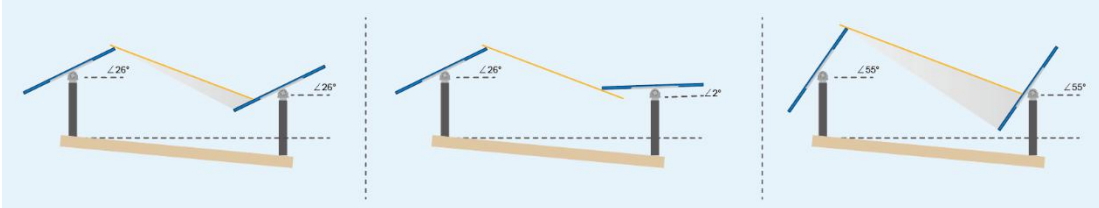


3e eZai ` [fZW 8[YgdW#(EgbWf dSU] e_ Sd TSU] fdSU] [Y SYad[fZ_ SVabfe
 ekefW_ abWsf[a` VSfS fa bWad_ VefgdTS` UWfdS[[Y S` V /adfi SVabfe G3H eW e[Y
 fWUz` a`aYk fa [VW f[Xk eZSV[Y S` V Ua` efdgUf fZdWZV_ W e[a` S^fWdS[ž 4SeW a`
 _ SUZ[W Wsd [Y SYad[fZ_ S` V ? [ZEZSV[Y ? aVWt [f agfbgfe fZW abf_ S^
 TSU] fdSU] [Y S` Y W Ydgb Xad ahWdS^ bai Wd YW Wsf[a` fZdagYZ [fWsf[hW
 VWU[e[a` Ž_ S] [Y S` V WXXUf[hWk W ZS` Ue fZW bai Wd YW Wsf[a` Sf fZW efSYW aX
 TSU] fdSU] [Y S` V Ua` eWcgW f k SUZ[hWVe fZW [VW f[XUSf[a` S` V abf_ [I Sf[a` aX
 Ua_ bWY fWdS[S` V Y[hVe Xg^b`Sk fa fZW bai Wd YW Wsf[a` SVhS` fSYWaXfdSU] W z



4SeW a` Fd[SEa`Sde `a` YZfWd_ efgVk a` fZWbai WdYW WdSf[a` UZScdSUFVd[ef[Ue aX
 BH _aVgW i [fZ!i [fZagf eZSV[Yt eWLa` VScK abfL [I Sf[a` [e bWdAd_WW a` fZW
 fZWadW[US^TSU]fdSU] [Y S` Y`W egUZ Se S` S`ki [Y fZW_L bSUF aX [VdSfUzTWir`WW
 SdbSke fa YWf fZWTSU]fdSU] [Y abfL [I Sf[a` S` Y`WYdagbž 3e eZai ` [fZW X(YgdW#) †
 fZWdW [e S` S`f[fgVW V[XWdW UW TWfi WW SdbSaz];X fZVk ef[^m dafSfW Sf fZW X`Sf
 TSU]fdSU] [Y S` Y`WaX \$" »† bai WdYW WdSf[a` `ae VgWfa eZSV[Ye i [^matUgd [██████████]
 eWLa` V S` V XagdfZ dai ež EgbWdFdSU] US` WXXWUf[hWk [VW f[Xk fWdS[[Xad_Sf[a`
 fZdagYZ G3HeZSe[VWdWUZ` a`aYk S` V/adfioX a

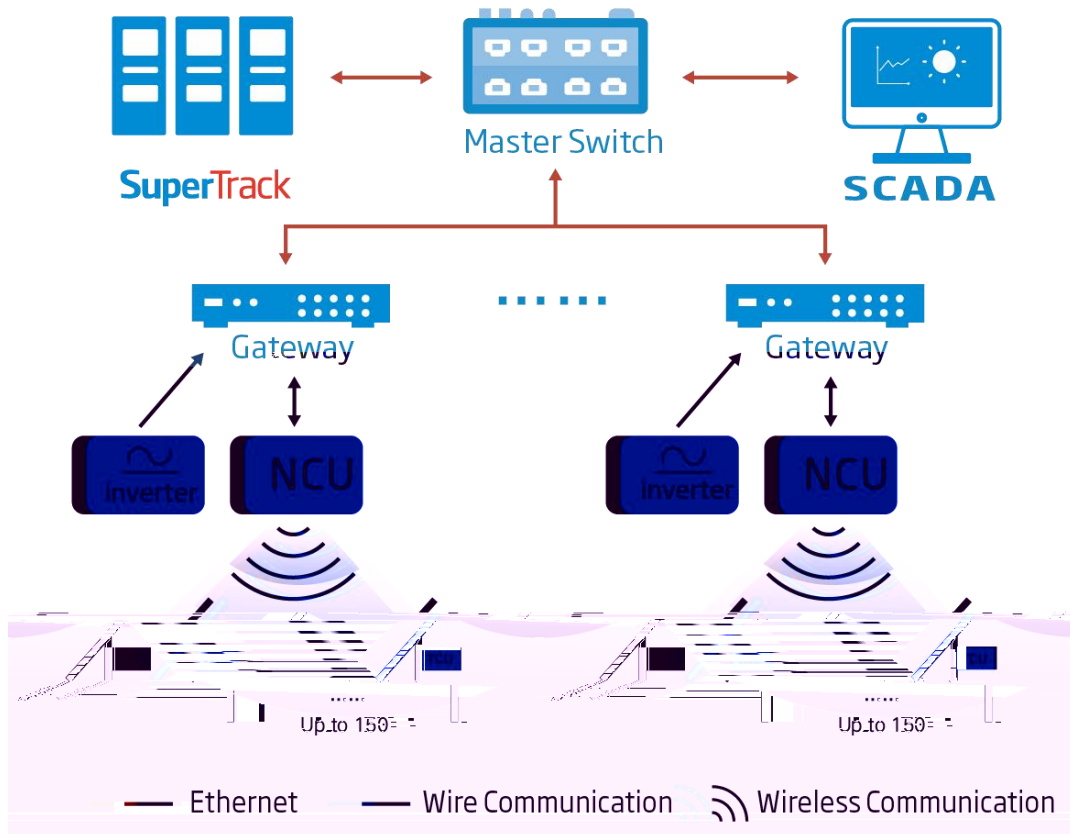
8[YgdW#*, 5a_ bSdfea` TWfi WW fZWEUZW_ WfZSf DWgUMé fZW3` Y`WG` f[^@af EZSVW
 S` V fZWEUZW_ WfZSf;` UdMSeWé fZW3` Y`WG` f[^: S`XEZSVW



3e eZai ` [fZX[YgdW#*† [h[W aXfZWbdaT`W_ fZSf fdSU] [Y SddSk [e eZSVW†
 YW WdS^abf [[Sf[a` S`Yad[fZ_ i [^dWgUWfZWfdSU] [Y S` Y`WG` f[^fZW_ aVg`W[e` af
 eZSVWž: ai WhWd [USeWaXYdMsfWd fWdS [V[XWdW UW fZW_ WfZaV` WWe fa dWgUW
 Wj UMé[hWS` Y`Wad[f [e ef[^eZSVW WhW [f [e] Wb f X`Sf i Z[UZ _ WS` e fZSf fZW[ddSV[S` UW
 USbfgdW Tk fZW_ aVg`WdWgUMé S` V ;3? `áee [e YdMsfž fZWdWadW [f _ [YZf TWS TWfWd
 abf [[Sf[a` _ WfZaV fa dWgUWfZWS` Y`WG` f[^bSd[S`k eZSVW ad [UdMSeWS UWdS [S`
 Y`WUa_ bSdW i [fZ dWgU] Y S` Y`Wž 3e S dMég`f† [f [e fZW_ aef dMSea` ST`Wfa W egdW
 fZWabf [S^ahWdS^bai Wd YW WdSf[a` Tk Ua_ bSd [Y fZWagfbgf dMég`fe aX V[XWdW f
 abf [[Sf[a` _ WfZaVež

5 SuperTrack System Architecture

8[YgdW#+, EgbWdF dSU] EkefW_ 3dJZ [fWUfgdW



Fd S e_ Sdf f dSU [Y ekefW_ Ua` e[efe f dSU] Wd efdgUfgdWd f dSU] Wd Ua` fda^g` [f /F5Gfi` Wfi ad] Ua` fda^g` [f/@5Gfi EgbWdF dSU] b`SfXad_ S` V E5363Z3`ea [f US` XWY [T`k _ SfUZ i [fZ [hWdFwd S` V afZWd Wcgb_ W fi fZWdWtk Tg[V` Y [fWdSfW ea`gf[a` e fa bZafaha fS[UfdSU] [Y ekefW_ z/8[YgdW#+f`F ST`W\$fi

FST`W\$, #` " ` ? | BH E fSf[a` 5a` X[YgdSf[a` FST`W

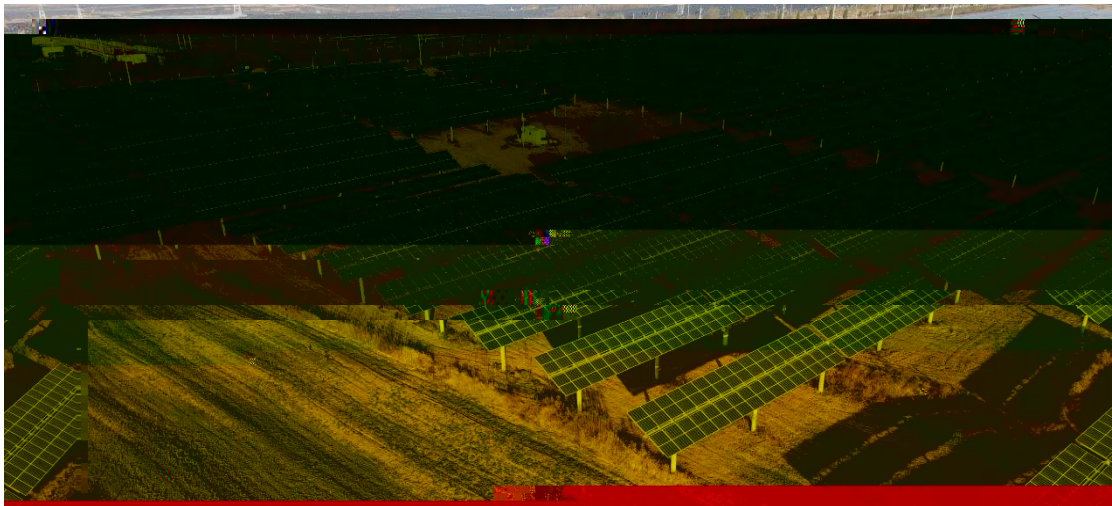
| | F dSU] [Y | F 5G | @5G | EaXfi SdWB`SfXad_ | EW ead |
|---------------------------------|-------------|--------|-----------|-------------------|--------|
| EgbWdF dSU] | #` " " eWfe | #` " " | #` " p\$" | #eWf | #eWf |
| 5a` hW f[a` S^ FdSU] [Y EkefW_ | #` " " eWfe | #` " " | #` " p\$" | ! | ! |

(Note: Sensing equipment shall be flexibly increased according to project zoning.)

6 Test Data and Gain Simulation

6.1 Test data

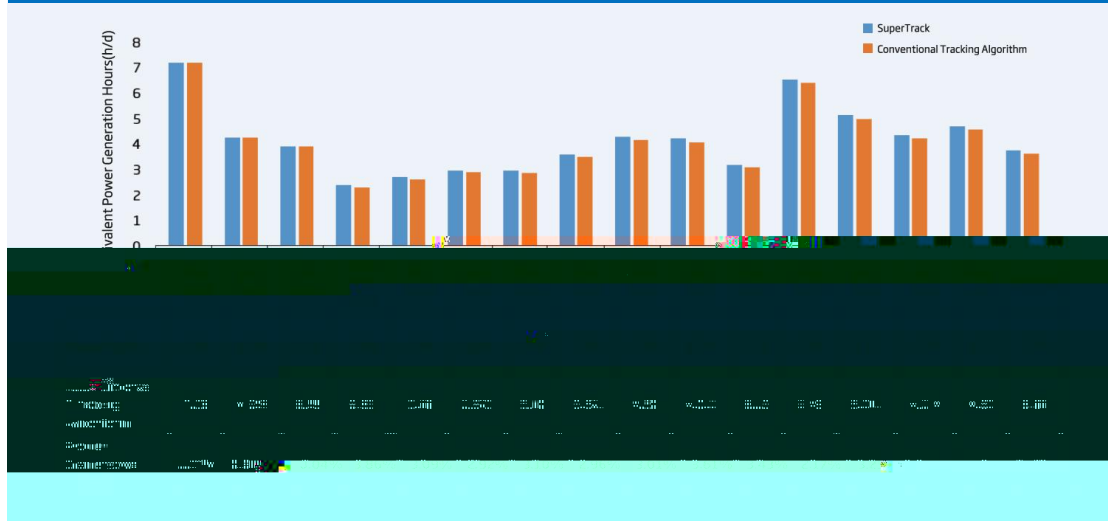
6.1.1 30MW mountain project in Tongchuan



FZWbai WdefSf[a` [e `aUSfW [K[g` 5ag` fkl Fa` YUZgS` 5[fkl EZSS` j [Bdah[UW
 5Z[Sz;f SVabfe T[XSU[S^_ aVg^WŁ Zad[a` fS^e[Y^WSj [e fdSU] Wd ekefW_ S` V eWUfē
 _ WSi SffZ^WhW^ bZafaha^fS[U SdSke i [fZ e_ [^Sd fWdS[Xad hWd[XUSf[a` ž EbWU[XU
 bdaWUf [Xad_ Sf[a` [eeZai ` [fZWfST^W%

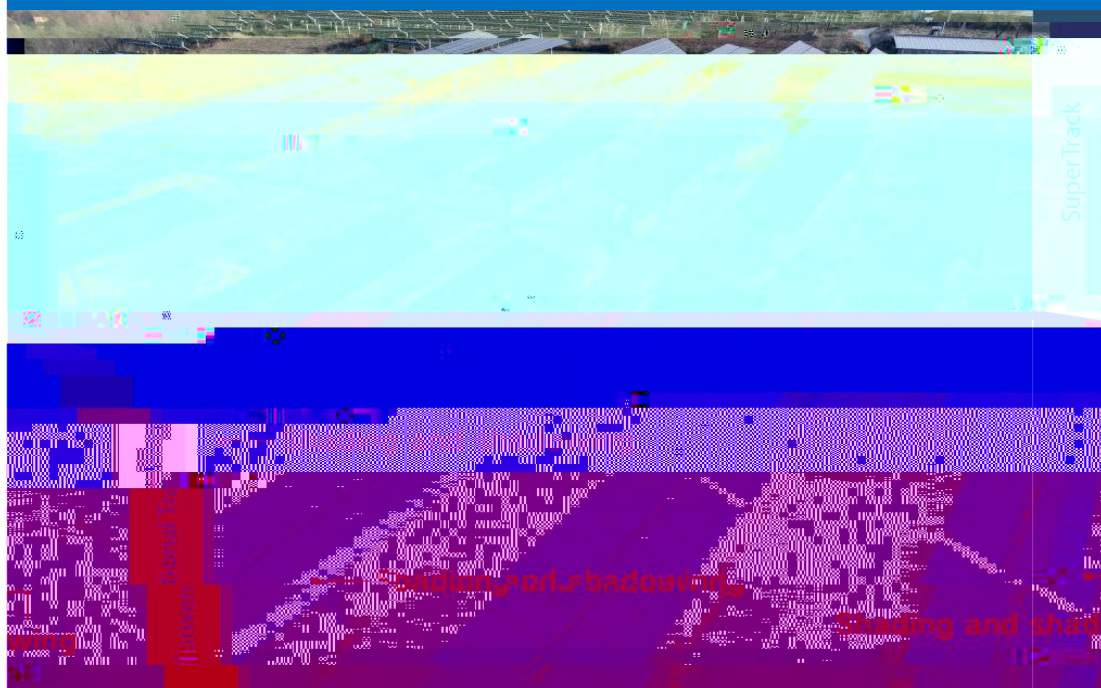
| FST^W% >[ef aX5a` V[f[a` eXad%` ? I ? ag` fS[BdaWUf [Fa` YUZgS` | | | |
|---|---------------------------------|-----------|--|
| BdaWUf e[fW | Fa` YUZgS` ł EZSS` j [| FWef f_ W | ? Sk \$" \$" ŽEWbfW_ TWd\$" \$# |
| >a` Y[fgVW S` V `Sf[fgVW | % ž&»@ # " +ž#) »7 | FWdS[| 3hWdSYWe^abW[e STagf % |
| AbWdSf[Y fW_ bWdSfgdW | ž\$#ž' p %+ž) | ? aVg^W | FE? Ž@79(? 5ž\$" /;fi %% I T[XSU[S^_ aVg^W |
| ;dSV[S` UW | #% "]I Z!_ 3p #&" "]I Z!_ 3/4 | fdSU] Wde | HS` YgSdV \$B |
| Bdabaf[a` aX V[XgeW | ' % | 95D | " ž&# |
| EgdXUW Ua` V[f[a` | 9cSee^S` V | : WYZf | %ž _ |

8[YgdW\$, 5a_bSd[ea` aX7cg[hS`W f Bai Wd9W WdSf[a` : agdS` V Bai Wd9W WdSf[a` 9S[[6[XWdW f? a` fze



3eZai` [fZXW[YgdW\$` fZXWbai WdSf[a` i SeUa`` WUFW [faYdV [? Sk\$` \$` f S` V [fSVabfW Sefda` a` [US^SYad[fZ_ XadS^SddSkeXda` ? Skfa`gkz3eS` WShgSf[a` TSe[eXadV[XWdW UWTWfi WW SddSkefZXWUa_bSd[ea` fWef i Se aXU[S^k efSdFW [EWbfW_TWd\$` \$` žFZWUa` hW f[a` S^fcdSU [YSYad[fZ_ [eef[^SVabfW Xadea` WSddSkež 4k Ua_bSd` YfZW[fWdSfW EgbWdFcdSU] SYad[fZ_ eXadSddSkefZXWShWdSYWaXeZSVW SddSke bcbad[f[a` [eSTagf%` . žFZWfWef` SefW XadS kWsd S` V fZWdWeg` feZai fZSf bai WdYW WdSf[a` [EgbWdFcdSU] SddSk i Se [bcdhW Tk %ž' (. fS` V fZWfWef VSfS i Se hW[XW Tk 595ž

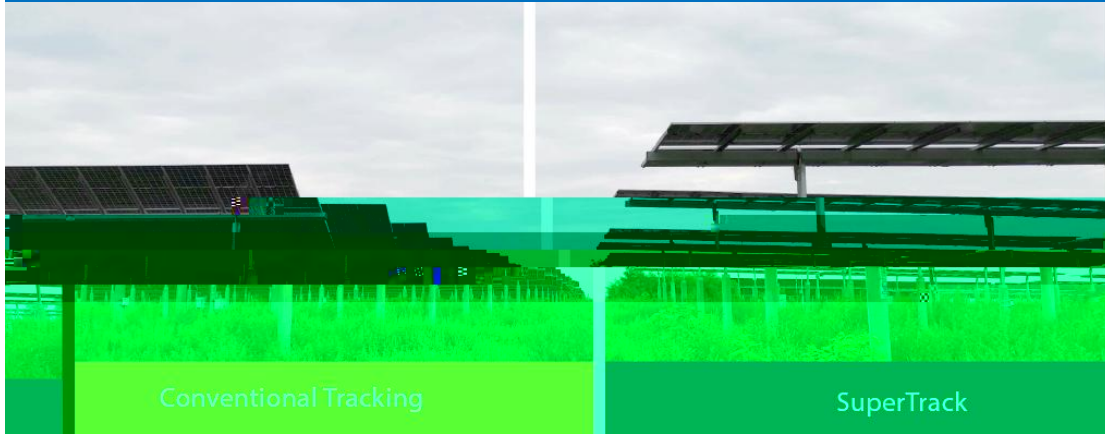
8[YgdW\$, >[hWbZafa aX5a` hW f[a` S^fcdSU [Y 3ddSk S` V EgbWdFcdSU] 3ddSk EZSV[Y Sf fZWEfSYWaX4SU] fcdSU [Y



3e eZai ` [fZWX(YgdW\$#i [hWbZafae aXfZWfWef bdaWUf [Fa` YUZgS` a`
eg` ` k VSke Sf fZWefSYWaXTSU] fdSU] [Yf eZSVai eZSVWS` V (YZf ^MS] SYWUS` TWXag` V
VgWfa fWdS[V[XWdW UW[Ua` hW f[a` S^fdSU] [Y SddSkz FZWdWadW EgbWdFdSU] SddSk
i [^abf[_ [l WV[XWdW f TSU] fdSU] [Y S` Y^Wd XadWdSUZ dai aXSddSke SUUadV[Y fa fWdS[
Ua` V[f[a` et dWgUW (YZf ^MS] SYWSe _gUZ Se baeet^Wi Z[WSha[V[Y eZSV[Yf S` V
W ZS` UWbai WdYW WdSf[a` Sf fZWefSYWaXTSU] fdSU] [Yz

EbWU[XUS^kt Se eZai ` [fZWX(YgdW\$#i fZWdWsdW' dai e aXfdSU] Wde [fZW

8[YgdW\$% 5a_ bSd(ea` aX3dSk 3` Y`MeTWfi VW EgbWdFdSU] 3`Yad[fZ_ S` V
 5a` hW f[a` S`FdSU] [Y 3`Yad[fZ_



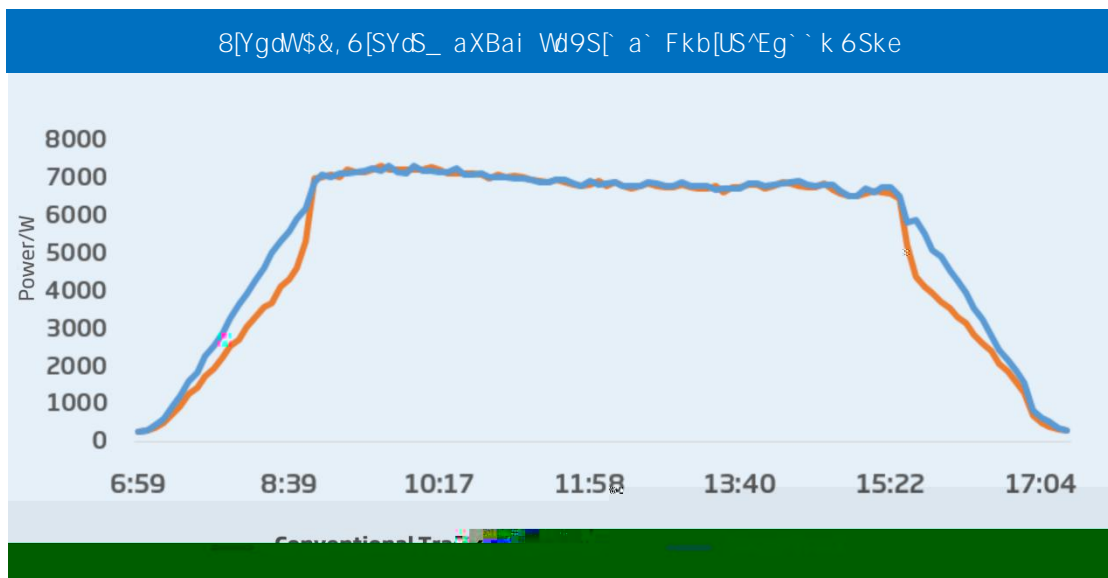
3e eZai ` [fZWX(YgdW\$%d a` ahWdUSeF ad dS[k VSket EgbWdFdSU] i [^b`SUWfZW
 fdSU] WdSf S e_ S^S` Y`Wad] Wnb fZWfdSU] WdXSf SUUadV[Y fa i VsfZWdUa` V[f[a` eZfZW
 YdVsfWdFZW[XWdW UWTWfi VW fZWSdSk S` Y`WaXUa` hW f[a` S`FdSU] [Y SYad[fZ_ S` V
 fZWabf[_ [l W SdSk S` Y`W fZWZ[YZWd fZWYS[` aX EgbWdFdSU] bai WdYW WdSf[a` žA`
 fkb[US^ahWdUSeF S` V dS[k VSket fZWWS[k bai WdYW WdSf[a` YS[_ Sk dVdUZ #\$\$* (. ž

6.1.2 Test field in Changzhou

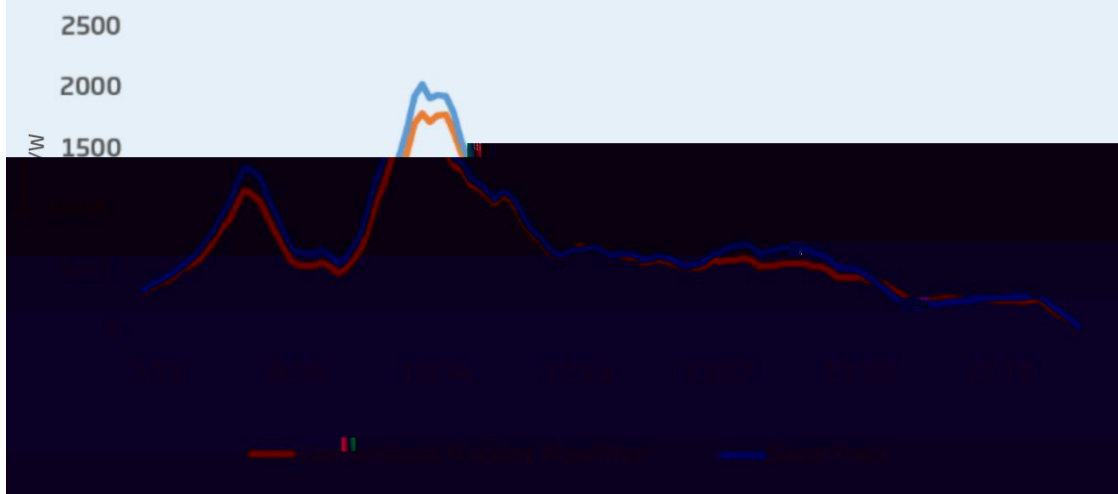


Fd S Ea Sd ZSe S'ea VW_ a` efdSfW fZSf SdSke i [fZ fZW EgbWf dSU] [fW YW f dSU] [Y S Y ad fZ_ ZShWe [Y` X[US` f'k [UdMSeW fZW d bai Wd agfbgf [5ZS` YI Zag fWef UW fWz

3e eZai ` [8[YgdW\$& S` V 8[YgdW\$' t a` S fkb[US^eg` ` k VSkf fZWSdSk agfbgf bai Wd [e e_ [Sd Vgd` Y fZW f dSU] [Y efSYW i Z[WVgd` Y Sf fZWefSYWaXTSU] f dSU] [Y fZW agfbgf bai Wd aXfZWLa` hW f[a` S^S Y ad fZ_ SdSk [e 'ai Wd VgWfa eZSV` YI i Z[W fZWEgbWf dSU] SdSk Sha [Ve eZSV` Yt dWeg` f` Y [S` [efS` fS` W age bai Wd [UdMSeWaX

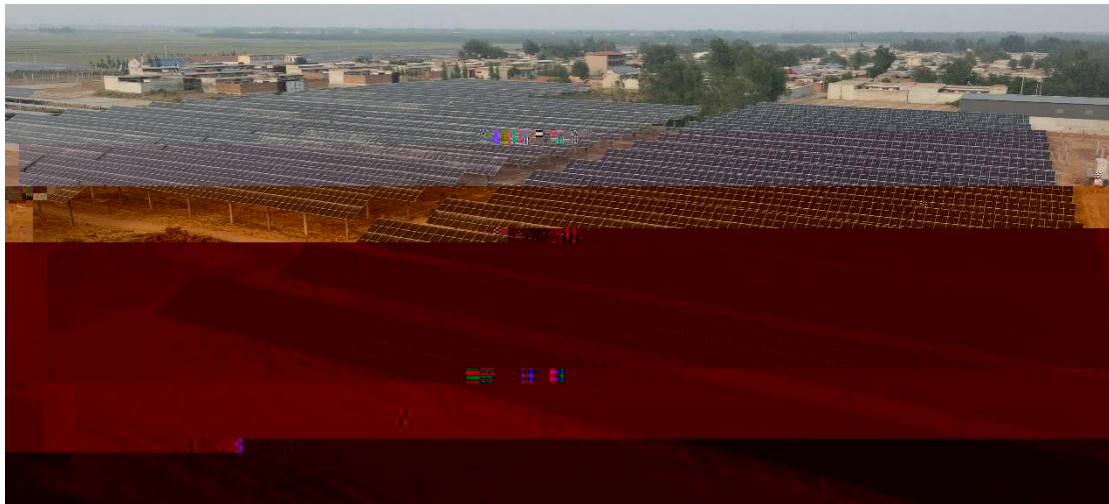


/@afWFZWYS[Ua_ bSd[ea` [e Xade` Y WZdai f dSU] Wdi Z[UZ SdWeZSVW [TafZ fZW_ ad [Y S` V SXfWd aa` fi



gb fa % . S` V S bai WdYW WdSf[a` YS[aXgb fa &ž &. ž;` fkb[US^ahWdUSeF Ua` V[f[a` et
fZWUa` hW f[a` S^fdSU] [Y S^Yad[fZ_ daSfWè Sf S` S` Y^Wfa fZWeg` f dWeg`f[Y [S` ai Wd
agfbgfi i Z[WfZWEgbWdFdSU] SddSk daSfWè fa S e_ S^WdS` Y^W dWeg`f[Y [S` ahWdS^
bai WdYS[aX+ž&#. ž

6.1.2 Test field in Nangong



EgbWdFdSU] ZSe TWW Sbb^TW fa &" " ? I bdaWUf ^aUSfW [@S` Ya` Y15Z[Sz FZW
fdSU] [Y ekefW_ i Se Ua` ` WUfW fa Yd[V [g` W \$" \$#ž 4k fZW W V aX EWbfW_ TWd
FdSU] [Y ekefW_ ZSV abWdSfW Xad)) VSke[[U'gV[Y \$' VSke aX Z[YZ`k V[XgeW
[ddSV[S` UW i WsfZWd S` V fZW ShWdSYW bai Wd YW WdSf[a` YS[[Z[YZ`k V[XgeW
[ddSV[S` UW i WsfZWdi Se%ž &. f [U'gV[Y S fkb[US^U'agVk VSk i [fZ S bai WdYW WdSf[a`
YS[aX*ž` % ž

6.2 Gain potential estimation and third-party verification

FZW _ S[XSUFade SXXWUF[Y bai Wd YW WdSf[a` YS[[UgVW S'f[fgVW fWdS[V[XXWdW UW/eZSV[Y SdSk bcbad[a` S` V e'abWfi V[XXgeW [dSV[S` UW bcbad[a` S` V ekefW_ VWe[Y` /egUZ Se SdSk b[fUZfi WfUZ FZW e[g'Sf[a` dWeg'fe aX fdSU] [Y YS[bafW f[S^ V[XXWdW f SdSe SdWeZai ` [fZWfST Wz

FST W&, FST WaXE[g'SfFW 6SfS XadEgbWf dSU Bai Wd9W WdSf[a` 9S[BafW f[S^

| Location | Latitude | GCR | Proportion of diffuse irradiance | Shading loss | | STA gain | SBA gain | Total gain |
|-------------|----------|------|----------------------------------|--------------|--------------------|----------|----------|------------|
| | | | | Pvsyst | TrinaTracker model | | | |
| Singapore | 1.37°N | 0.70 | 56.00% | 7.35% | 7.35% | 2.23% | 5.88% | 8.11% |
| Bangalore | 12.99°N | 0.64 | 41.70% | 5.83% | 6.73% | 1.08% | 5.38% | 6.46% |
| Ranikhet | 27.70°N | 0.64 | 55.30% | 5.58% | 5.58% | 1.70% | 4.46% | 6.16% |
| Mexico City | 19.13°N | 0.60 | 42.30% | 5.18% | 5.18% | 0.88% | 4.57% | 5.55% |
| Jeddah | 22.30°N | 0.58 | 39.40% | 4.12% | 5.59% | 0.59% | 4.47% | 5.06% |
| Guangzhou | 23.14°N | 0.57 | 66.80% | 3.78% | 3.78% | 2.26% | 3.02% | 5.28% |
| Columbia | 34.01°N | 0.46 | 45.60% | 4.30% | 4.30% | 0.77% | 3.44% | 4.21% |
| Tongchuan | 35.14°N | 0.45 | 56.80% | 2.56% | 2.98% | 1.16% | 2.38% | 3.54% |
| Hokkaido | 43.23°N | 0.33 | 54.10% | 2.79% | 2.79% | 0.91% | 2.23% | 3.14% |

Note: Shading loss SBA gain is calculated at the slope of 10° and the proportion of shaded arrays of 50%



4SeW a` eWXZVhWabW e[g'Sf[a` eaXfi SdW Fd[SF dSU] Wd eWwUFW fkb[US^ 'aUSf[a` e [V[XXWdW f 'Sf[fgVWe S` V V[XXWdW f U[SFW Ua` V[f[a` e fa e[g'SfW fZW eZSV[Y 'aee S` V WhS'gSfW fZW YS[bafW f[S' FGHZEG6 geW fZW [VgefckZi [W SgfZad[fSf[hW eaXfi SdW BHekef fa USdk agf e[g'Sf[a` UZWU] [Y a` fZWeZSV[Y 'aee aX fkb[US^ 'aUSf[a` e[i Z[UZ [e TSe[US^k Ua` e[efW f i [fZ fZW US'g'Sf[a` dWeg'fe aXF d[Sie eWXZVhWabW eaXfi SdW E9E hWd[XW fZWWhS'gSf[a` bcaUWe S` V dWeg'fe aXEgbWf dSU] YS[ZEF 3 YS[[e_ S['k SeeaU[SfW i [fZ fZWS` `gS^V[XXgeWbcbad[a` aX fZWbcaWUf e[fW [Zz fZWZ[YZVd fZWV[XXgeWbcbad[a` fZWYdMSfWd fZWEF 3 YS[z 8ad WY S_ b'W [9gS` YI Zagf EF 3 YS[[e STahW\$, -E43 YS[[e SeeaU[SfW i [fZ 95Di fWdS[

e'abWS` V eZSV[Y SdSk bcbadfa` t [ZVfZWYdMSfWdfZW95Df FZW'SdYWdfZWe'abWf FZW
 Z[YZWdfZW eZSV[Y SdSk bcbadfa` t S` V FZW Z[YZWdfZW E43 YS[ž 8ad Wj S_ b'W
 E[YSbadW Se S'ai ŽSf[fgVWSdMSf[e VWe[Y` W Se bWdefS` VSdV i ZWdW95D SUJag` fe Xad
 S 'SdYWdbcbadfa` t S` V fZWefSYWaXTSU] fdSU] [Y 'Sefe XadS `a` YWdf_ W ea E43 YS[
 ZSeSYdMSfWdbafW f[SžE9E Ua` X[d_ W fZSf fZWYS[dWeg'f [e dMSea` ST'WS` V dW[ST'Wž
 3f fZWeS_ Wf_ W 595 Ua` VgUFW S` SgfZad[fSf[hWhWd[XUSf[a` a` fZWSUJgdSuk S` V
 WXXWUf[hW Wee aXfZWVSfSž;` [fe dWbadf fZW595 VdW fZWxa`ai [Y Ua` U'geja` e, FZW
 fWef [Fa` YUZgS` 'SefW XadS kWSd S` V fZWdWeg'fe eZai fZSf bai WdYW WdSf[a` [
 EgbWdFdSU] SdSk i Se_ bcahW Tk %ž' (ž595 [V[USfWe fZSf fZWfWef VSfS [e hS'Vž



7 Conclusions

FZW_Sd] Wf eZSdWaXfZWfcdSU] [Y ekefW_ YdSVgS^k [UaVSeW VgWfa [fe XMSfgdWaX Z[YZ bai Wd YW WdSf[a` ž Fd[SFcdSU] Wd ZSe S† Ske TWW Ua__ [ffWw fa fWUZ` a^aYk [`ahSf[a` † [_ bcah[Y bai Wd YW WdSf[a` aXfZWfcdSU] [Y ekefW_ † dWgU[Y >A57 S` V [_ bcah[Y ;DDž EgbWdFcdSU] dW[Ve a` 4;? † ? [ŽEZSV[Y ? aVW` fa VWWb`k efgVk fZW bai Wd YW WdSf[a` UZSdSUWd[ef[Ue aXfZW_ aVg`Vet Vk` S_ [US^k eWW] abf[S^fdSU] [Y S` Y^W[dMS^f[W W ZS` UWbai Wd YW WdSf[a` g` VVd fZWUa` V[f[a` e aX Z[YZ V[XgW [cdSV[S` UW i VSFZWd S` V Ua_ b^y fVcdS[† S` V Y[hWXg^b^Sk fa fZWbai Wd YW WdSf[a` SVhS` fSYW aX fcdSU] Wž 5a_ bSdW i [fZ Ua` hW f[a` S^fdSU] [Y SYad[fZ_ † fZW bai Wd YW WdSf[a` YS[[_ bcahVe Tk %ž* , ž

EgbWdFcdSU] [e XMSfgdW i [fZ Z[YZ [fW^fYW f bWdAd_ S` UWS` V Z[YZ SVSbfST[†fk† Se i W^ Se eWXžbWdUmbf[a` † eWXžVsd [Y S` V eWXžWU[e[a` Ž_ S] [Y† i [fZagf Zg_ S` [fWchW f[a` [fZWabf[[I Sf[a` bcaUMeež 3^ea† [f Xg^k _ SfUZVe Fd[S fcdSU] Wd[_ Wwf fZW[hWdeW WWe aXUgefa_ Wd[S` V US` TWXWY [T^k Sbb^fW fa V[XWdW f bca WUfež

FZdagYZ fZWagfVaad fWef a` _ S` k bca WUf e[fVe Xad_ adWfZS` S kVsd [f [e Xag` V fZSf EgbWdFcdSU] fWUZ` a^aYk [e efST^WS` V dW[ST^WS` V US` W egdWUa` f[gage bai Wd YW WdSf[a` YS[aX fZWfcdSU] [Y ekefW_ ž;` SVV[f[a` † fZ[dV bSdfk ZSe Ua` VgUfWw S` SgfZad[fSf[hWhWdX[USf[a` a` fZWW_ b[d[US^VSfS† i Z[UZ [e SgfZW f[US` V WXXWUf[hVž

;` fZW ahWdS^Ua` fVj f fZSf ` W` W WdYk _ Sd] Wf VWhWabe dSb[V^k† bZafaha^fS[U [Vgefck [e _ ah[Y fai SdVe YdV bSdfk† S` V [fe WfWd S^bgd[eg[f [e fa [_ bcahWbai Wd YW WdSf[a` ž;` fZWXgfgdW EgbWdFcdSU] fWUZ` a^aYk i [^TWi [VWk geWw [Fd[S fcdSU] [Y ekefW_ † fSb fZWbai Wd YW WdSf[a` bafW f[S^aXfZWfcdSU] [Y ekefW_ fa fZW_ aef Wj fW ft _ S] [[I W ekefW_ WXX[U[W Uk† dWgUW >5A7† Td[Y Z[YZWd YS[e fa Ugefa_ Wd[S` V Ua` fd[Tgfwfa SUZ[W h[Y 5SdTa` BWS] 3` V 5SdTa` @WgfdS^†fk fSdYWfež