

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 network of white lines and dots.

TrinaTracker

Trina Smart Tracking Technology

3 | Z [fWBSbWd
a` EgbWdFdSU]

The logo for SuperTrack, with "Super" in white and "Track" in red. Below the text is a stylized graphic of a solar panel array. The background is a blue gradient with a network of white lines and dots.

SuperTrack

Contents

1. Abstract

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;` fcbVgUf[a`

2. Background

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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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7. Conclusions

1 Abstract

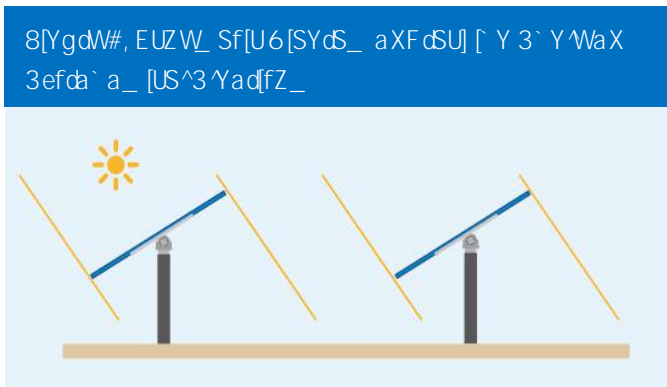
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SYad[fZ_ ZSe TWW [_ bcahWf [adVd fa [UdMSeWfZWSVSbfST [ffk aXfcdSU] [Y ekefW_
fa g` VhW fVdS[t [_ bcahWfZWbai WdYW WdSf[a` g` VVdV[XXWdW f i WdSfZVdUa` V[f[a` et
S` V Vy bS` V fZW Sbb [USf[a` eUW Sd[ae aX fcdSU] [Y ekefW_ t e_ Sd fcdSU] [Y SYad[fZ_
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2 Background

2.1 Introduction of conventional tracking algorithm



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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
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dWSf[a` eZ[b fa US`Ug`SfWfZWdWSf[hWbae[f[a` aX fZWeg` /ZVZ fZW[U[VW UWS` Y`WaX
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[U[VW f ea` SddSkel fZWZ [YZWd fZW[cdSV[S` UWdWUW[hW Tk fZW_ aVg`WZ8[YgdW#fi

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TSU] f dSU] [Y US` TWaTfS[VW SUUadV[Y fa fZW[U[VW f ea` SddSkel SddSk b[fUZ S` V SddSk

Diagram illustrating the geometry of solar radiation on a tilted surface. It shows the sun's position, the surface normal, and the angle of incidence. The distance between the sun and the surface is labeled d_1 .

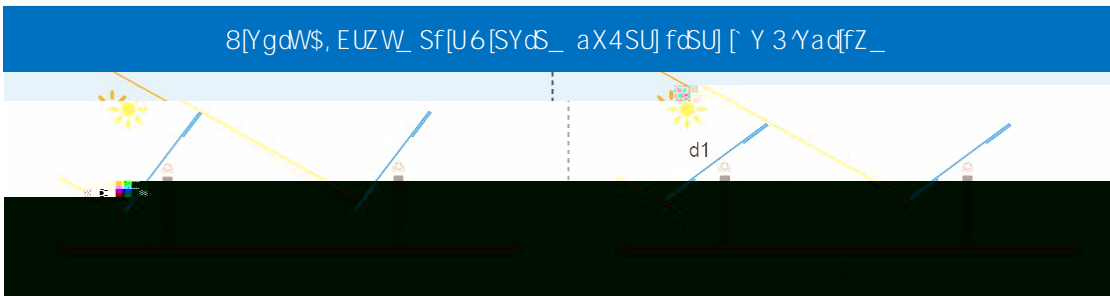
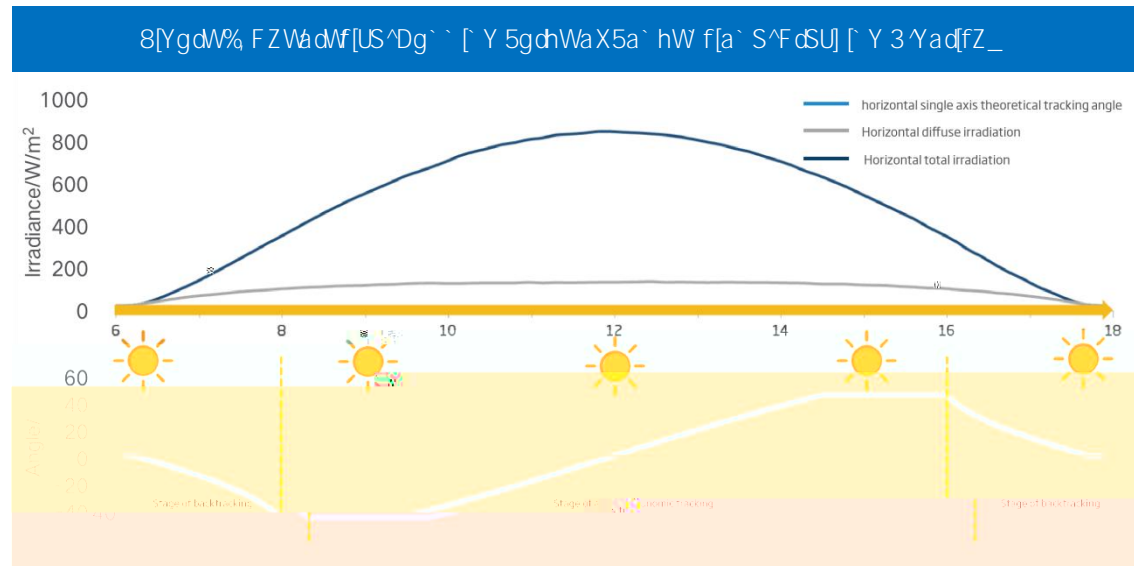


Diagram illustrating the geometry of solar radiation on a tilted surface. It shows the sun's position, the surface normal, and the angle of incidence. The distance between the sun and the surface is labeled d_1 .

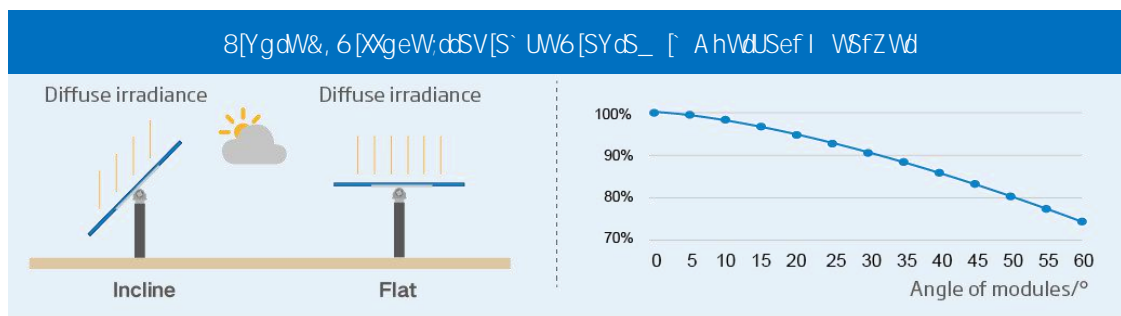


2.2 Deficiencies of conventional tracking algorithm

Diagram illustrating the geometry of solar radiation on a tilted surface. It shows the sun's position, the surface normal, and the angle of incidence. The distance between the sun and the surface is labeled d_1 .

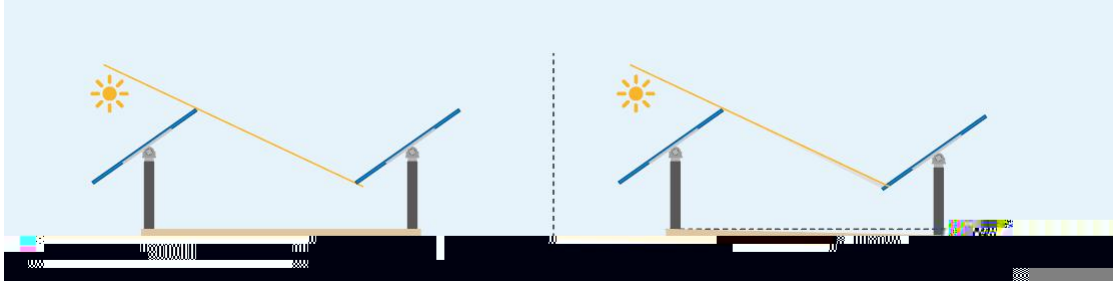
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I ZW [f Ua_ We fa fZWefSfWaXdMS^i VsfZWd Z[YZ V[dWUf [dsV[S` UWi VsfZWd/eg` ` k VSkfi U`agVk S` V Z[YZ`k V[XgeW [dsV[S` UWi VsfZWd/ahWdUSeF S` V dS[k VSkefi_ Sk UaZy [efl S` V fZWdWsdW_ adWahWdUSeF S` V dS[k VSke [ea_ WsdMSel SUag` f[Y Xad _ adWfZS` ' " , aXfZW i Za`WkVsdž 3UadV[Y fa e]k V[XgeW[dsV[S` UW_ aVW[[fZW Z[YZ`k V[XgeW [dsV[S` UW i VsfZWd Se fZW _ aVg`W S` Y`W [UdMSel fZW V[XgeW [dsV[S` UWUSbfgdW Tk fZWXd` f e[VWaXfZW_ aVg`WYdSVgS`k VUdMSel fZWV[XgeW [dsV[S` UWUSbfgdW Tk fZW_ aVg`Wsf S e_ 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[et 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[dsV[S` UW`aee_ Sk dMSUZ gb fa #' , Ua_ bSdW i [fZ TW[Y] Wbf X`Sfz/8[YgdW&fi



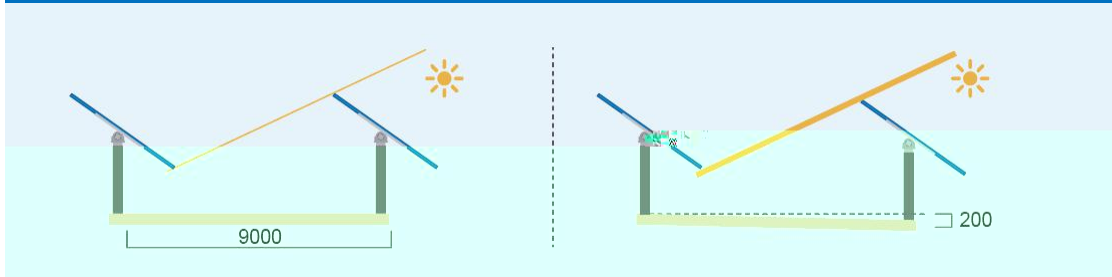
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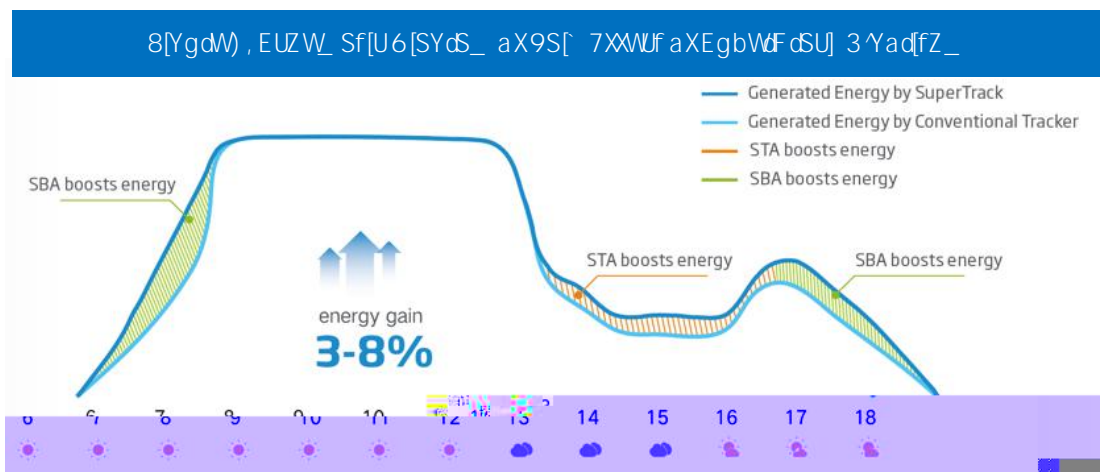
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8[YgdW(, EUZW_ Sf[U6[SYdS_ aX>[YZf >W6] SYW5SgeW Tk 3 f[fgVW6 [XWdW UWTWfi WW 3dSke



3 Definition and Main Value Points of SuperTrack

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 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`aYkZEgbWdF dSU] t [UygV[Y e_ Sd f SYad[fZ_ t _ g^fZeagdW
 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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 YW WdSf[a` bafW f[S^aX f dSU] Wd 5a_ bSdW i [fZ Ua` hW f[a` S^ f dSU] [Y SYad[fZ_ t fZW
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<p>High energy yield</p>	<p>High adaptability</p>	<p>High intelligence</p>	<p>High stability</p>
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- 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

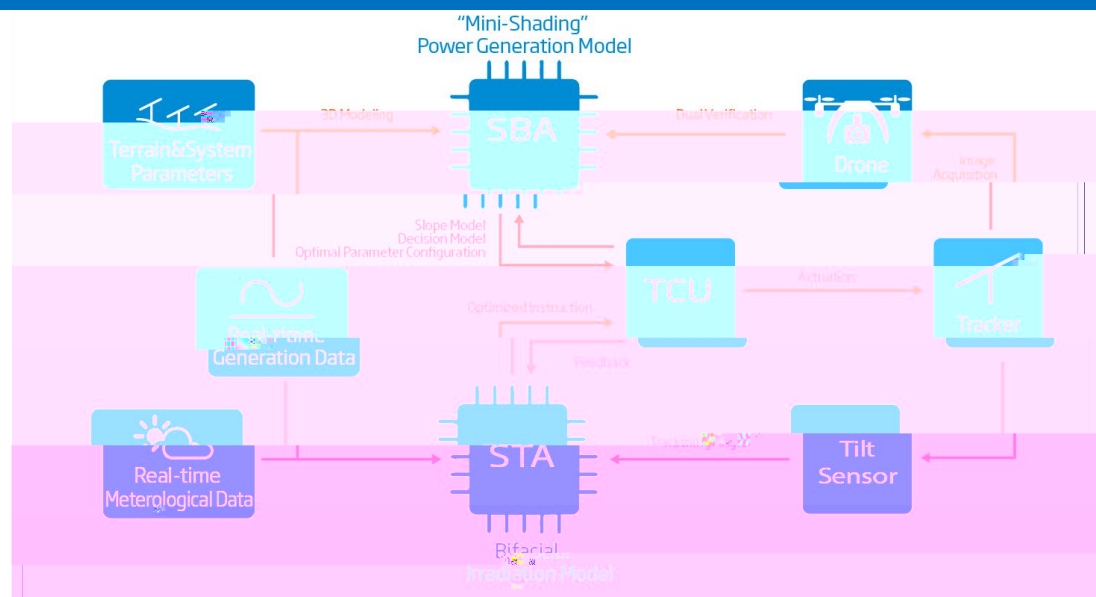
SuperTrack comprises two key algorithms:

1 | Smart Tracking Algorithm (STA) is used to optimize high diffuse irradiance weather.

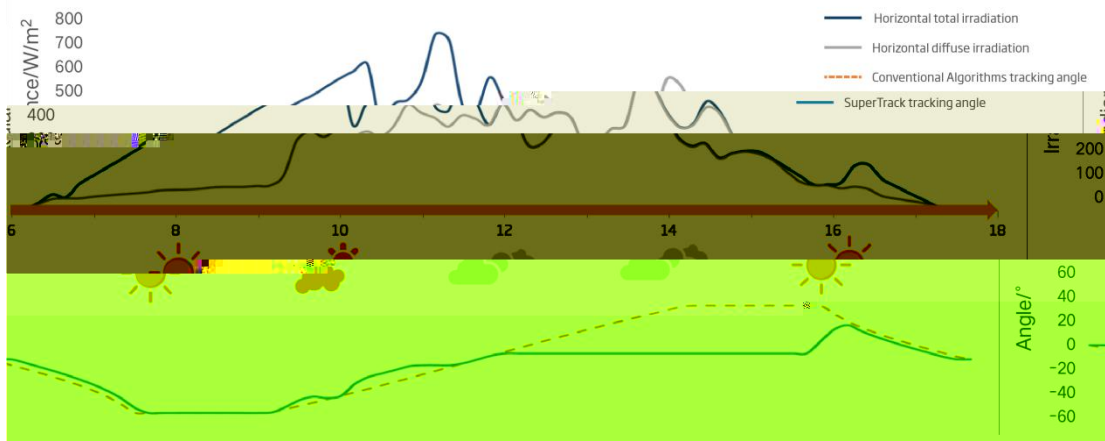
2 | Smart Backtracking Algorithm (SBA) is used to solve the shading problem.

3 | Smart Backtracking Algorithm (SBA) is used to solve the shading problem.

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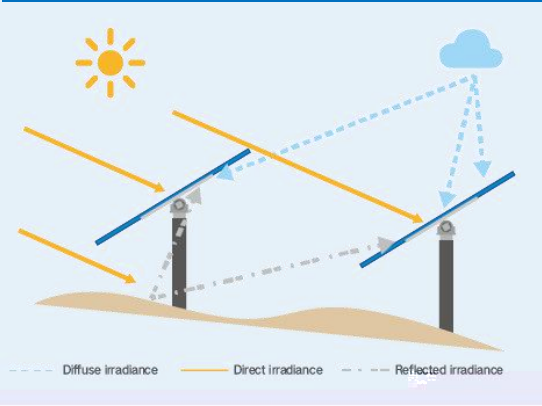
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4.1 Tracking angle optimization STA for high diffuse irradiance weather

4.1.1 BIM

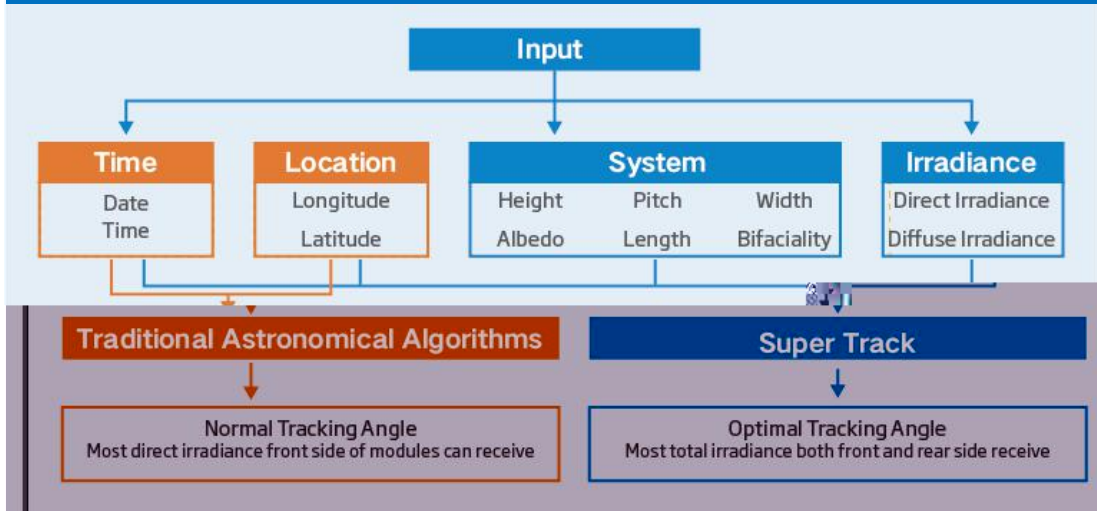
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 TWW S fdW V fZSf _a` aXSU[S^_ aVg`W [Zad[
 a` fS^e[Y`WSj [e fdSU]Wd ekefW_ i [^ TW dM`S
 UW Tk T[XSU[S^_ aVg`WZ FZW Ua` hW f[a` S^
 Sefda` a_ [US^ fdSU] [Y SYad[fZ_ a` k Ua`
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 ^WT[XSU[S^_ aVg`W` WWVe fa

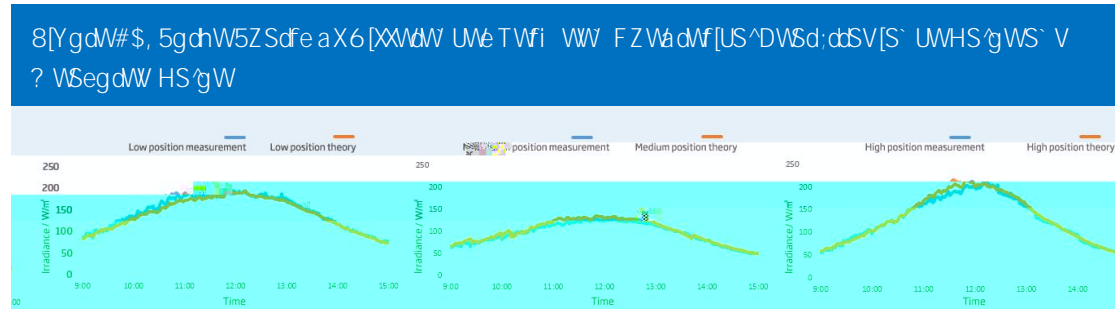
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 a` aXSU[S^_ aVg`We g` VVd V[XXdW f Ua` V[f[a`
 ezFZW4;? ad[Y[S`k VWhWabW Tk Fd[S fS] We [fa
 Xg`^SUUag` f # \$] WK XSUfadet US`Ug`SfWe
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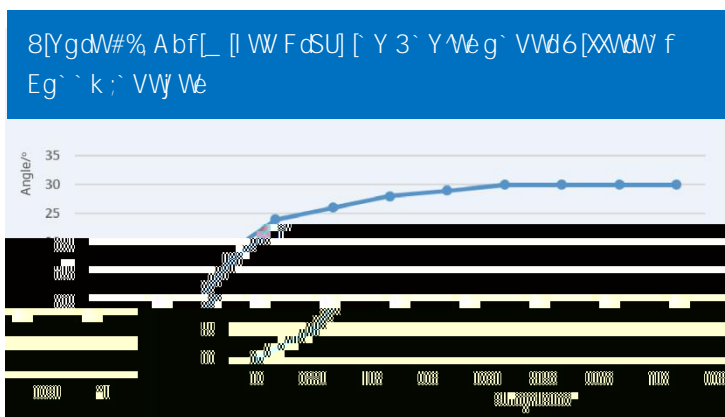


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4.1.2 Tracking angle optimization for high diffuse weather

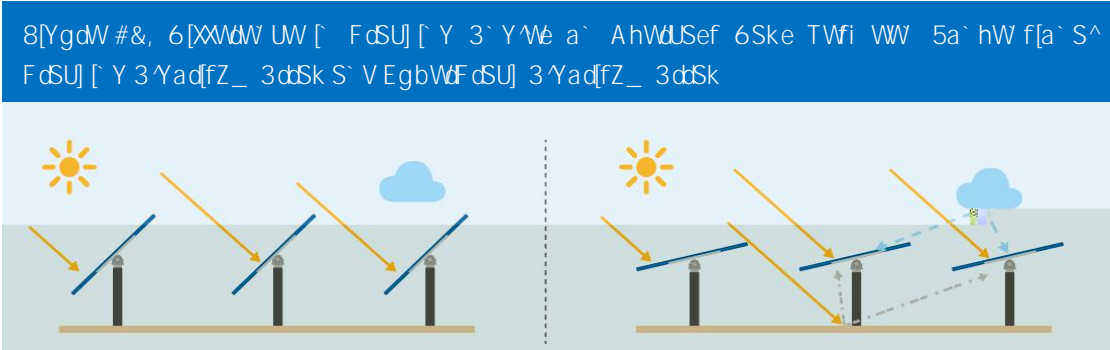


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 :XfZWeg` ` k [VVj [e Z[YZWdfZWsefda` a_ [US`S` Y`WeZS`^TWgeWž:XfZWeg` ` k [VVj [e
 `ai Vd egUZ Se" ž† fZW_ Sj [_ g_ fdSU [Y S` Y`WaXfafS`^ [dSV[S` UW[e #) »ž:XfZWeg` ` k
 [VVj [e Vj fdW_ Wk `ai † [VždS[k VSkel fZWfZWdWf[US`fdSU [Y S` Y`W[e" »† S` V fZWfafS`^
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 [_bdahWe bai Wd YW WdSf[a` [Z[YZ`k V[XXgeW [dSV[S` UW i WsfZWd SUUadV[Y fa
 _ WfWada`aY[US`S` V ekefW_ abWdSf[a` VSfSž

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 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`Wēž



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`WaXfZWefdgUfgdWet S` V Vj fW V fZWgeWk^ [XWaX_ afade S` V
 efdgUfgdWēž FZWZ[YZ V[XXgeWsdWset 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 fZWdafSf[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 WW SdSke hSdVef S` V SXFwd Sbbcbq[SfWk [UdMSe[Y fZW ebSU[Yt ea_ WaXfZWSdSke i [^ef[^TW eZSVW t i Z[W ea_ WSdSke ZShW^YZf W S] SYV? adVahWd Xda_ fZW bW ebWUf[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

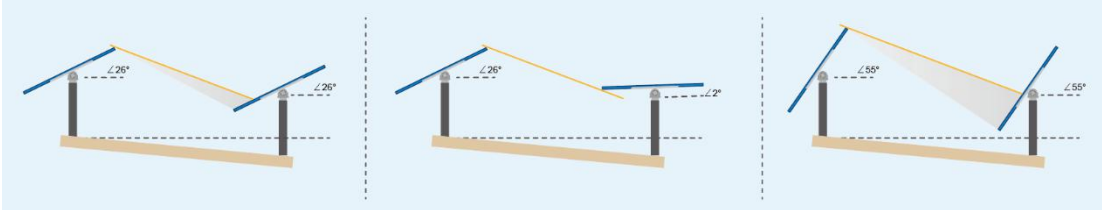
8[YgdW#(, 6[SYd_ aXE43 aXEgbWf dSU]



3e eZai ` [fZW 8[YgdW#(EgbWf dSU] e_ Sd TSU] fdSU] [Y SYad[fZ_ SVabfe ekefW_ abWsf[a` VSfS fa bW Xad_ V[efgdTS` 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 ? aVW [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] [Yt S` V Ua` eWcgW f k SUZ [W hVe fZW [VW f[XUSf[a` S` V abf_ [I Sf[a` aX Ua_ b`Wj 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_ efgVka` fZWbai WdYW WdSf[a` UZScSUFVd[ef[Ue aX
BH _aVg^We i [fZ!i [fZagf eZSV[Yt eWUa` VSck abf[_ [l Sf[a` [e bWdXad_ Ww a` fZW
fZWadW[US^TSU] fdSU] [Y S` Y^W egUZ Se S` S^ki [Y fZW[_ bSUF aX_ [e_ SfUZ TWfi WW
SddSke fa YWf fZWTSU] fdSU] [Y abf[_ [l Sf[a` S` Y^WYdagbž 3e eZai ` [fZWXYgdW#) †
fZWdW [e S` S^f[fgVW V[XWdW UW TWfi WW SddSkež ;X fZWk ef[^ dafSfW Sf fZW X^Sf
TSU] fdSU] [Y S` Y^WaX \$" »† bai WdYW WdSf[a` `aee VgWfa eZSV[Ye i [^aUugd [fZW
eWUa` V S` V XagdfZ dai ež EgbWdF dSU] US` WXXWUf[hWk [VW f[Xk fWdS[[Xad_ Sf[a`
fZdagYZ G3H eW e[Y fWUZ` a`aYk S` V /adfiiSU] [~~Xd~~

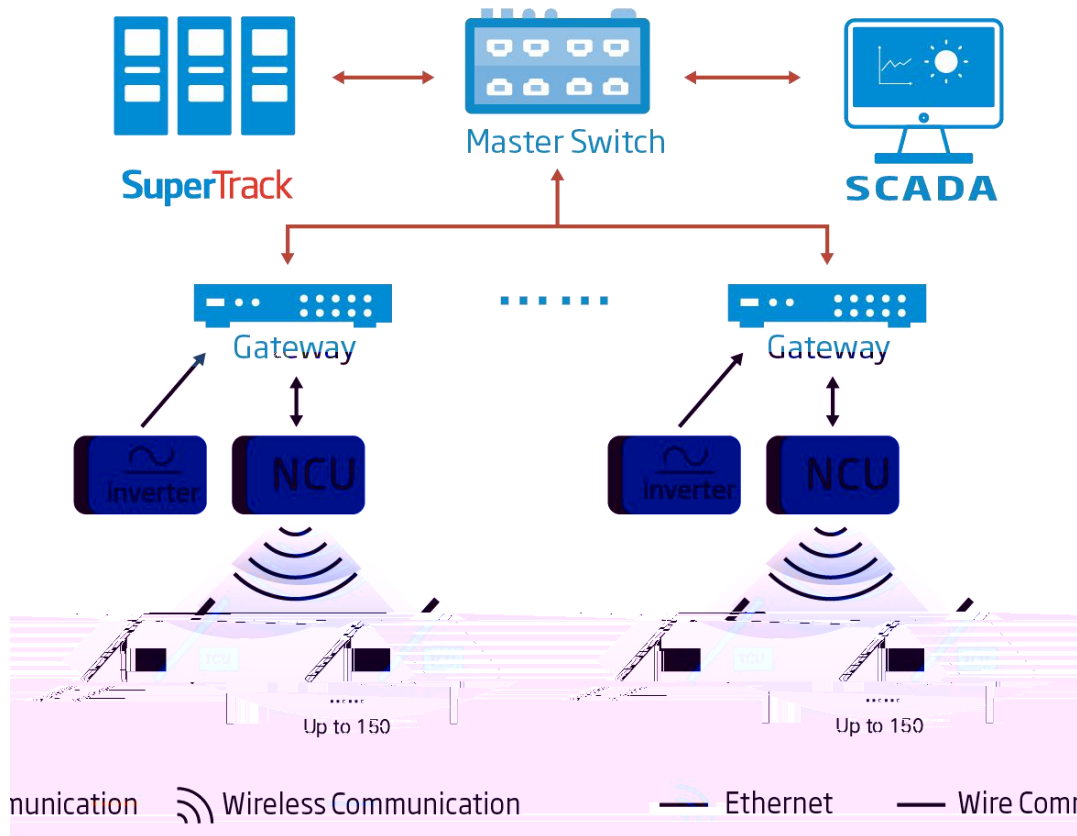
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 S` V fZWEUZW_ WfZSf;` UdMSeWé fZW3` Y`WG` f[^: S`XEZSVW



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 fdSU [Y ekefW_ Ua` e[efe fdSU] Wd efdgUfgdWd fdSU] Wd Ua` fda^g` [f /F5Gfi` Wfi ad] Ua` fda^g` [f/@5Gfi EgbWdF dSU] b`SfXd_ S` V E5363z3`ea [f US` XWj [T`k _ SfUZ i [fZ [hWdFwd S` V afZwd Wcg[b_ W fi fZWdWtk Tg[V` Y [fWdSfW ea`gf[a` e fa bZafaha fS[UfdSU] [Y ekefW_ ž/8[YgdW#+f`F ST`W\$fi

FSTW\$, # " ? | BHEfSf[a` 5a` X(YgdSf[a` FSTW

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

6 Test Data and Gain Simulation

6.1 Test data

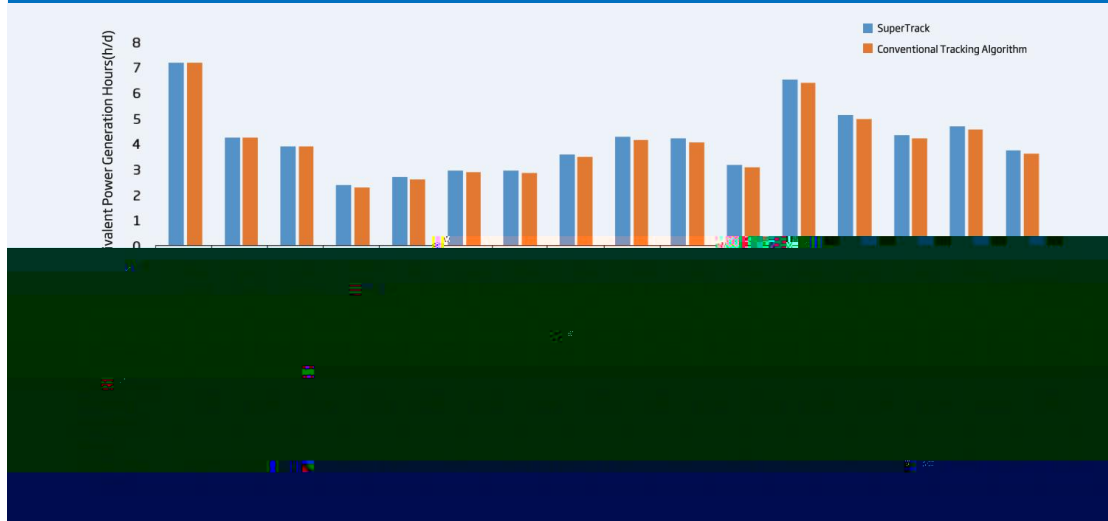
6.1.1 30MW mountain project in Tongchuan



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 eWUfe
 _ WSi SffZ`WhW` bZafaha`fS[U Sddske i [fZ e[['Sd fWddS[` Xad hWd[XUSf[a` ž EbWU[XU
 bda`WUf [Xad_ Sf[a` [eeZai ` [fZWfST`W%

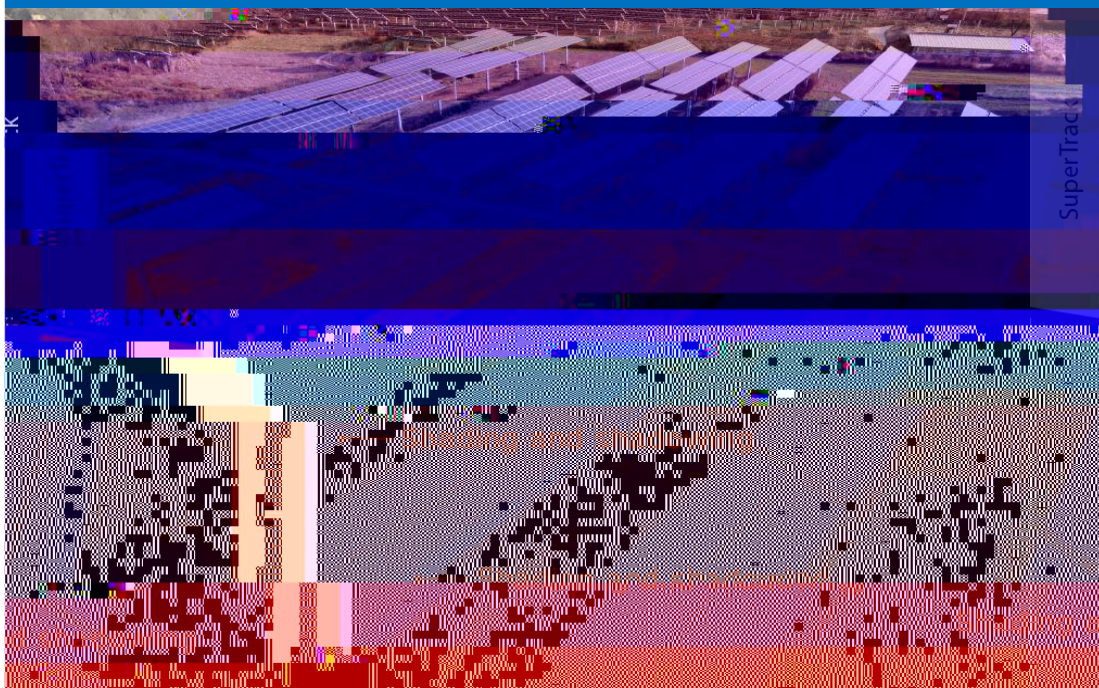
FST`W% >[ef aX5a` V[f[a` eXad%" ? I ? ag` fS[Bda`WUf [Fa` YUZgS`			
Bda`WUf e[fW	Fa` YUZgS` f EZSS` j [FWef f_ W	? Sk \$" \$" ŽEWbfW_ TWd\$" \$#
>a` Y[fgVW S` V`Sf[fgVW	% ž&»@ #"+ž#) »7	FWddS[3hWdSYWe`abW[e STagf %
AbWdSf[Y fW_ bWdSfgdW	Ž\$#z' p %+ž)	? aVg`W	FE? Ž@79(? 5ž" /;fi %% I T[XSU[S^_ aVg`W
;ddSV[S`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

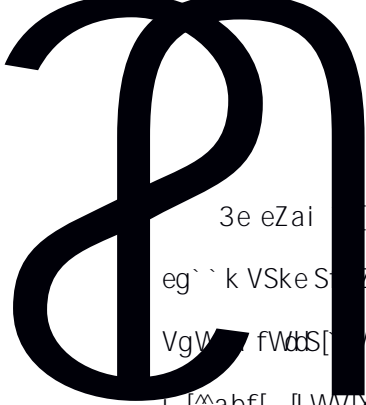
8[YgdW\$, 5a_bSd[ea` aX7cg[hS^W f Bai Wd9W WdSf[a` : agdS` V Bai Wd9W WdSf[a` 9S[[6[XWdW f? a` fze



3eZai` [fZX[YgdW\$` fZXWbai WdSf[a` i SeUa`` WdSf[a` faYdV [? Sk\$` \$` f S` V [fSVabfW Sefda` a` [US^SYadfZ` XadS^SddSkeXda` ? Skfa`gk`3eS` WhS`gSf[a` TSe[eXadV[XWdW UWTWfi WW SddSkefZXWUa_bSd[ea` fWef i Se aXX[U[S`k efSdFW [EWbfW_TWd\$` \$` žFZXWUa` hW f[a` S^fcdSU [YSYadfZ` [eef[^SVabfW Xadea` WSddSkež 4k Ua_bSd[YfZXW [fWdSfW EgbWdFcdSU] SYadfZ` eXadSddSkefZXWShWdSYWaXeZSVW SddSke bcbad[f[a` [eSTagf%` . žFZXWfWef` SefW XadS kVsd S` V fZXWdWeg`fe eZai` fZSf bai WdYW WdSf[a` [EgbWdFcdSU] SddSk i Se [bcdhW Tk %ž' (. f S` V fZXWfWef 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

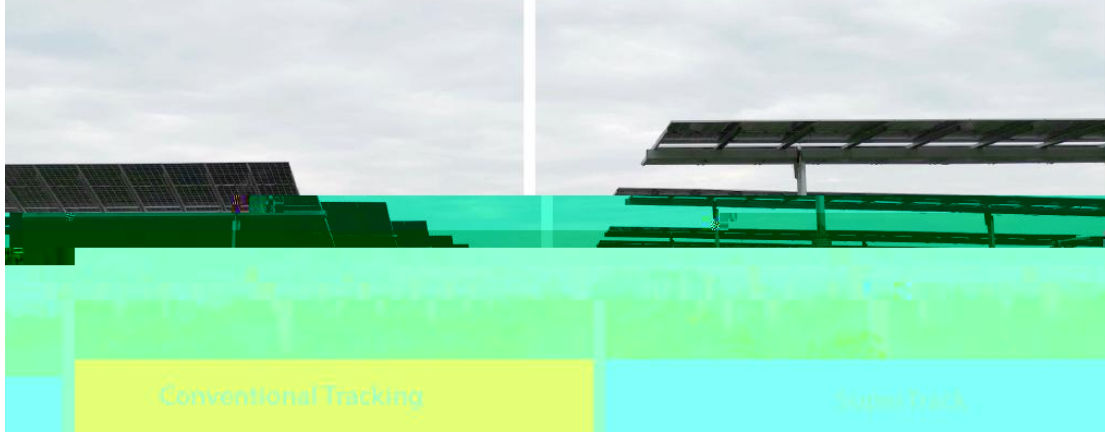




3e eZai [fZWX(YgdW\$#i [WZ hWbZafae aXfZWfWef bdaWUf [Fa`YUZgS` a`
 eg` `k VSkeS ZWefSYWaXTSU] fdSU] [Yf eZSVai eZSVWS` V (YZf W) SYWUS` TWXag` V
 VgV fWdS [XWdW UW [Ua` hW f[a` S^fdSU] [Y SddSkz FZWdWadW EgbWdF dSU] SddSk
 [^abf [I WV XWdW f TSU] fdSU] [Y S` Y Wd XadWdSUZ dai aX SddSke SUUadV [Y fa fWdS [
 Ua` V[f[a` et dWgUW (YZf W) SYWSe _gUZ Se baeet W i Z[WSha[V [Y eZSV [Yf S` V
 W ZS` UWbai WdYW WdSf[a` Sf fZWefSYWaXTSU] fdSU] [Yz

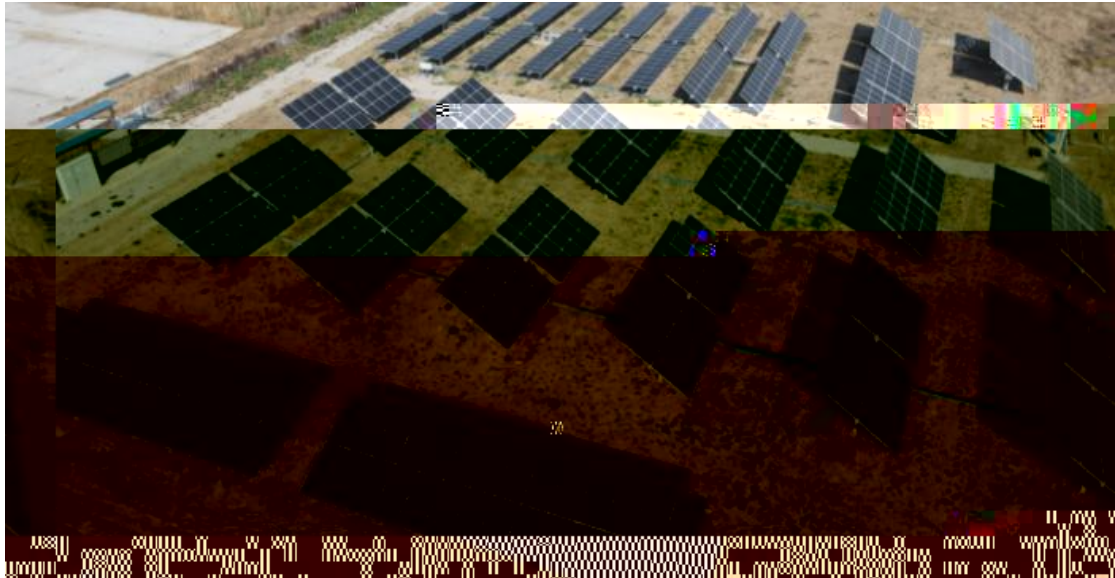
EbWU[XUS^kt Se eZai ` [fZWX(YgdW\$#i fZWdWScW' dai e aXfdSU] Wd [fZW

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



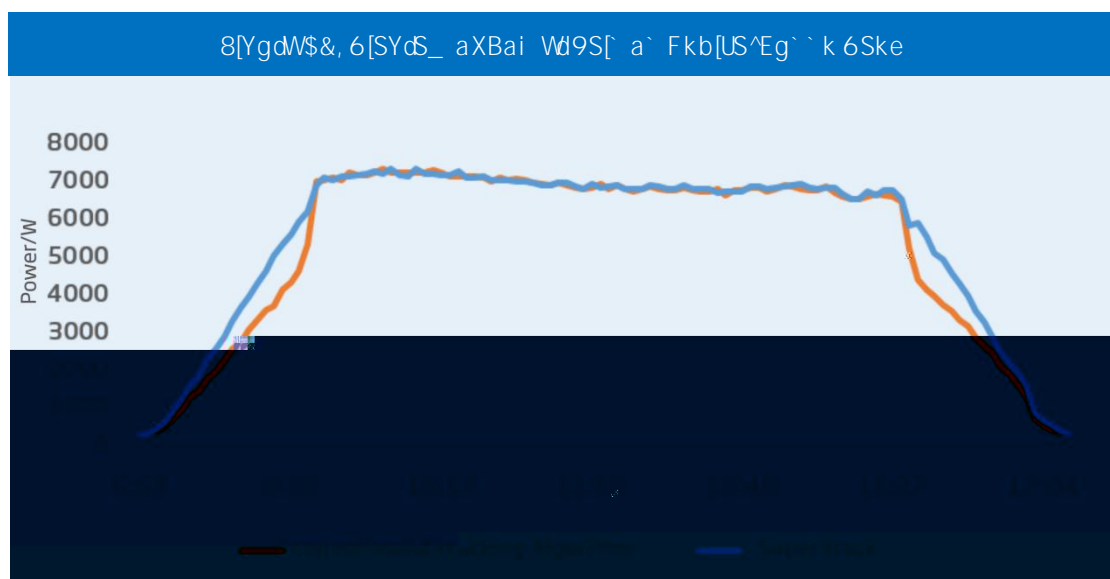
3e eZai ` [fZWX(YgdW\$% a` ahWdUSeF ad dS[k VSket EgbWdFdSU] i [^b^SUWfZW
fdSU] WdSf S e_ S^S` Y^Wad] WWb fZWfdSU] WdXSf SUUadV[Y fa i VsfZWdUa` V[f[a` eZfZW
YdVsfWdFZW[XWdW UWTWfi VW fZWSdSk S` Y^WaXUa` hW f[a` S^fdSU] [Y SYad[fZ_ S` V
fZWabf[_ [l VW SdSk S` Y^W fZWZ[YZWd fZWYS[` aX EgbWdFdSU] bai WdYW 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



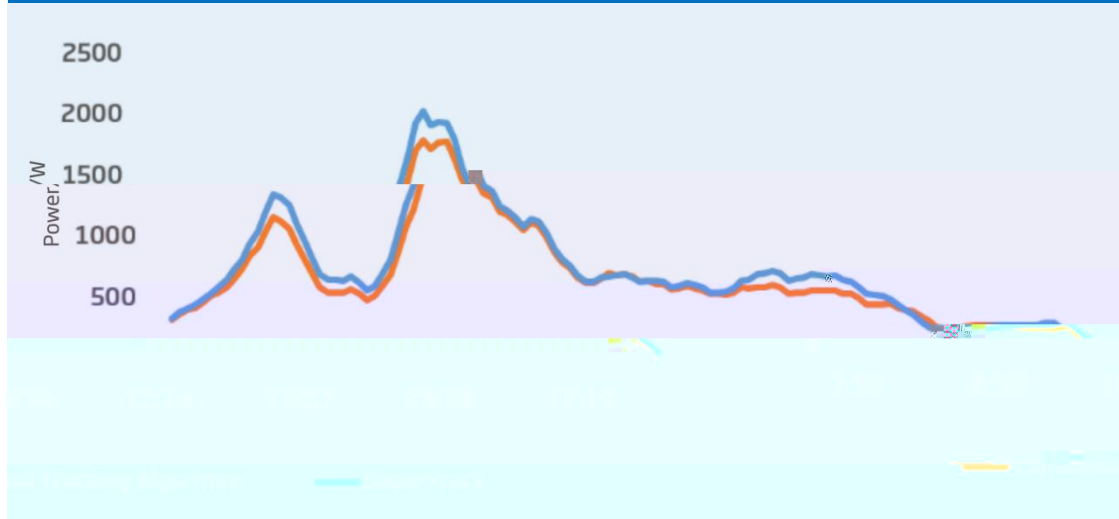
Fd S Ea Sd ZSe S'ea VW_ a` efdSfW fZSf SdSke i [fZ fZW EgbWf dSU] [fW YW f dSU] [Y S Y ad fZ_ ZShWe Y` X US` f k [U d M Se W fZW d bai W d agfbgf [5Z S` YI Zag fWef UW fWz

3e eZai ` [8 YgdW \$ & S` V 8 YgdW \$' t a` S fkb [US^ eg` ` k VSk t fZW SdSk agfbgf bai W d [e e_ [Sd Vgd` Y fZW f dSU] [Y efSYW i Z [W Vgd` Y Sf fZWefSYWa X T SU] f dSU] [Y fZW agfbgf bai W d a X fZW La` hW f [a` S^ S Y ad fZ_ SdSk [e ' ai W d Vg Wfa eZSV [Y i Z [W fZW EgbWf dSU] SdSk Sha [Ve eZSV [Y t dW eg` f [Y [S` [efS` fS` W age bai W d [U d M Se Wa X



/@afW fZWYS [Ua_ bS d f ea` [e X ad e [Y W d ai f dSU] W di Z [UZ Sd We ZSVW [TafZ fZW_ ad [Y S` V SX f W d aa` fi

8[YgdW\$' , 6[SYdS_ aXBai Wd9S[a` Fkb[US^AhWdUSef 6Ske



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_ daSfVè Sf S` S` Y^Wfa fZWeg` f dWeg`f[Y [S` ai Wd
agfbgfi i Z[WfZWEgbWdFdSU] SdSsk daSfVè 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)) VSket [U'gV[Y \$' VSke aX Z[YZ`k V[XgeW
[dSV[S` UW i WdFZWd S` V fZW ShWdSYW bai Wd YW WdSf[a` YS[[Z[YZ`k V[XgeW
[dSV[S` UW i WdFZWd 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_ VVe[Y` /egUZ Se SdSk b[fUZfi WfUZ FZW e[_ g'Sf[a` dWeg'fe aX fdSU] [Y YS[bafW f[S^ V[XXWdW f SdMSe SdWeZai ` [fZWfST WZ

FST W&, FST WaXE[_ g'SfW 6SfS XadEgbWdFdSU 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%	2.23%	5.88%	8.11%
Bangalore	12.99°N	0.64	41.70%	5.83%	6.73%	1.08%	5.38%	6.46%
Bangkok	13.70°N	0.64	55.30%		5.58%	1.29%	4.46%	6.16%
Mumbai	19.07°N	0.68	43.50%		5.84%	1.29%	4.46%	6.16%



4SeW a` eWXZVWhWabW e[_ g'Sf[a` eaXfi SdW Fd[SF dSU] Wd eWMUFW 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'Ug'Sf[a` dWeg'fe aXF d[Sie eWXZVWhWabW eaXfi SdW

E9E hWd[XW fZWWhS'gSf[a` bcaUMee S` V dWeg'fe aXEgbWdFdSU] YS[ZEF 3 YS[[e_ S['k Seea[USfW i [fZ fZWS` `gS^V[XXgeWbcbad[a` aX fZWbcaWUf e[fW [ZVZ fZWZ[YZVd fZWV[XXgeWbcbad[a` fZWYdMSfWd fZWEF 3 YS[z 8ad WY S_ b'W [9gS` YI Zagl EF 3 YS[[e STahW\$, -E43 YS[[e Seea[USfW 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_ bW
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 dV[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 fWUJ` 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 WdSfZWd S` V Ua_ b^y fWdS[† S` V Y[hWXg^b^Sk fa fZWbai Wd YW WdSf[a` SVhS` fSYW aX fcdSU] Wdž 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` † eWXžWsd [Y S` V eWXžWU[e[a` ž_ S] [Y† i [fZagf Zg_ S` [fWdW f[a` [fZWabf[[l 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†W 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] fWUJ` 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[hWhWd[XUSf[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^bgdēg[f [e fa [_ bcahWbai Wd YW WdSf[a` ž;` fZWXgfgdW EgbWdFcdSU] fWUJ` 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] [[l 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

