

DOCKET NO. **SA- 516**

EXHIBIT NO. **13D**

**NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C**

**Radar Data From 8/23 and 24**

**(56 Pages)**

NATIONAL TRANSPORTATION SAFETY BOARD  
Office of Research and Engineering *gtr*  
Washington, DC

January 28, 2000

## Recorded Radar Study

### Specialist's Report of Investigation by Alice Y. Park

DCA96MA070

#### A. ACCIDENT

Location : East Moriches, NY  
Date : 07/17/96  
Time : 2031 local standard time  
Aircraft : B747-131, N93119

#### B. GROUP

Not Applicable

#### C. SUMMARY

On July 17, 1996, about 2031 eastern daylight time, a Boeing 747-131, N93119, operated as Trans World Airlines Flight 800 (TWA800), crashed into the Atlantic Ocean, about 8 miles south of East Moriches, New York, after taking off from John F. Kennedy International Airport (JFK), Jamaica, New York. All 230 people aboard the airplane were killed. The airplane, which was operated under Title 14 Code of Federal Regulations (CFR) Part 121, was bound for Charles De Gaulle International Airport (CDG), Paris France.

#### D. DETAILS OF INVESTIGATION

The purpose of this radar data study is to show the nature of primary and secondary radar returns from FAA's Islip radar antenna under weather conditions similar to those existing at the time of the time of TWA 800 accident.

The Weather Specialist used the following criteria to identify days that had similar weather conditions to the day and time of the TWA 800 accident.

1. No low level temperature inversions in the Upton, New York upper air data (0000Z).
2. Similar temperature profile.
3. Similar moisture profile.
4. Similar wind profile.
5. Similar surface weather observations from Westhampton Beach, New York (KFOK).

Two dates nearly matched the criteria: August 23, 1999, and August 24, 1999. On August 23, the surface weather observations and temperature, moisture and wind profiles were very similar to the conditions at the time of the TWA accident; however, a low level temperature inversion was present on that date. On August 24, there was no low level temperature inversion;

however, the surface observations and temperature, moisture, and wind profiles, although similar to the conditions at the time of the TWA 800 accident, were not as close as those on August 23.

Compared with Upton July 18, 1996 at 0000Z (July 17, 1996 at 2000 EDT), Upton August 24, 1999 at 0000Z (August 23, 1999 at 2000 EDT) temperatures were 24.0 degrees C versus 27.8 degrees C at the surface and 23.8 degrees C versus 27.2 degrees at a pressure of 1000 millibars; at 925 millibars 19.4 degrees C versus 22.2 degrees C; at 850 millibars 13.0 degrees C versus 15.4 degrees C; at 700 millibars 1.8 degrees C versus 5.4 degrees C; and at 500 millibars -12.1 degrees C versus -9.3 degrees C.

Compared with Upton July 18, 1996 at 0000Z (July 17, 1996 at 2000 EDT), Upton August 25, 1999 at 0000Z (August 24, 1999 at 2000 EDT) temperatures were 23.0 degrees C versus 27.8 degrees C at the surface and 22.4 degrees C versus 27.2 degrees at a pressure of 1000 millibars; at 925 millibars 19.4 degrees C versus 22.2 degrees C; at 850 millibars 14.6 degrees C versus 15.4 degrees C; at 700 millibars 4.0 degrees C versus 5.4 degrees C; and at 500 millibars -10.1 degrees C versus -9.3 degrees C.

Attachment I shows a plot of upper air data for 7/18/96 at 0000Z Upton, New York versus 8/25/99 at 0000Z Upton, New York. Because the data for August 23 and August 24 equally matched the criteria, the Safety Board selected and reviewed the data for both dates.

#### I. Data Conversion

The data from New York Approach Control (NYTRACON) were converted from range/azimuth data to x/y position data relative to the FAA's Islip, New York Airport (ISP) Surveillance Radar (ASR) radar site. The coordinate conversion was accomplished using NTSB software. All radar data sets were aligned in x/y position assuming that the FAA radar data position was the most accurate.

Attachment II provides a table of the filenames that contain the radar data used in this report. These files are available on CD-ROM on the NTSB public Docket for the TWA flight 800 accident investigation. Attachment II also provides plots of primary and secondary radar returns in the vicinity of the TWA flight 800 crash site between 2230Z-0230Z (1830-22030 Local), focusing on 16 nautical miles East-West Distance and 12 nautical miles North-South Distance from ISP radar (Attachment II).

**Alice Y. Park**  
**Radar Specialist**  
**Vehicle Performance Division**

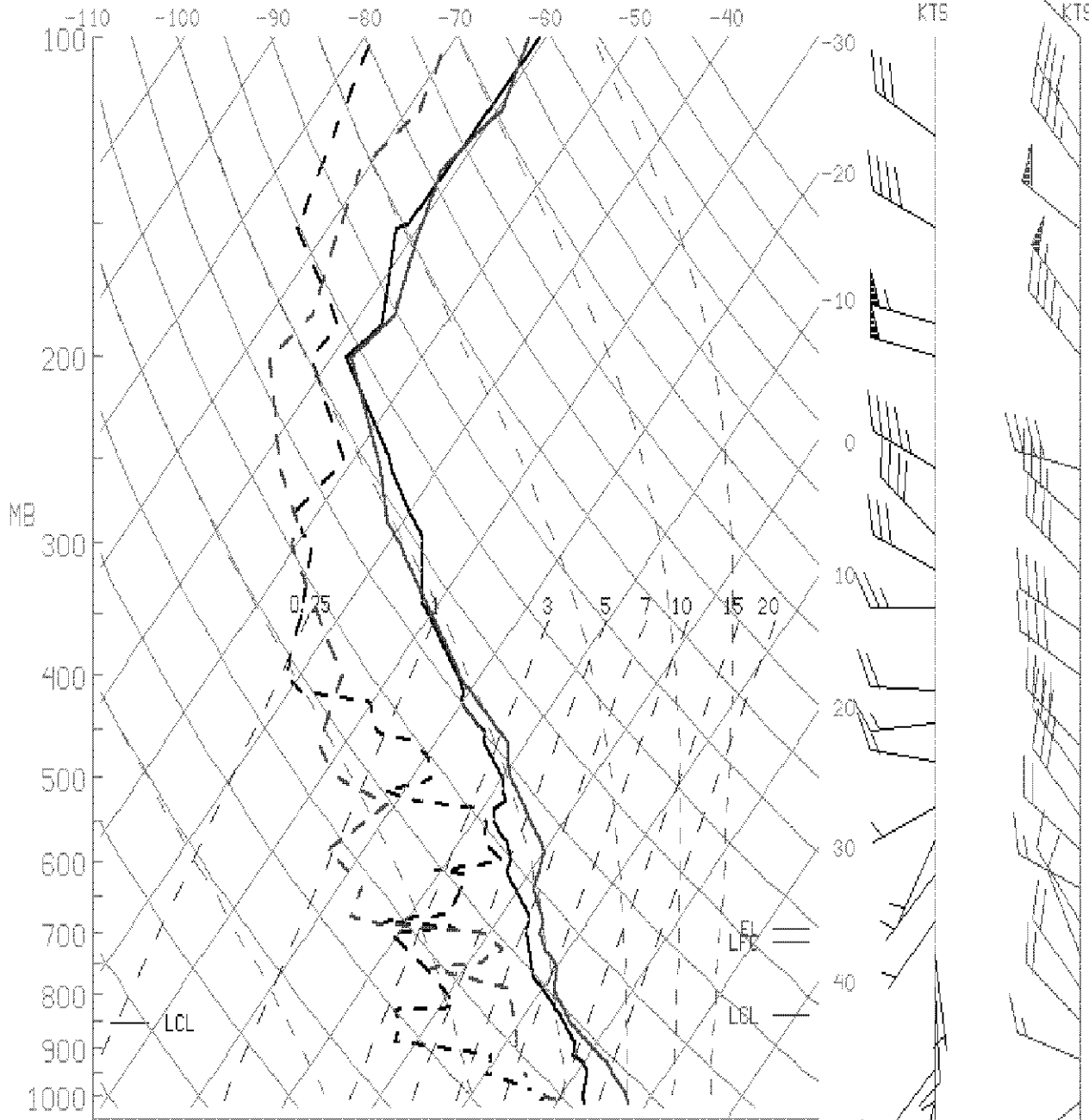


# **ATTACHMENT I**

0000 UTC 25 Aug 1999237  
 0000 UTC 18 Jul 1996200

72501 UPTON  
 72501 UPTON

NY US  
 NY US



KI	LI	SWI	TTI	CVT	FMAX	ThE	EL	MIX	PW	CAPE	HELI
6.3	4.1	25.9	31.4	----	29.3	323.7	----	9.9	25.3	----	17
28.1	0.6	190.4	43.4	33.3	32.2	332.2	694.4	11.6	30.4	7	57

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## **ATTACHMENT II**

### **CD-ROM File names North vs. East Plots**

## CDR DATA Files

File Name	Content
1_2300BT.txt	Aug23 2230-2300Z Beacon data
1_2300RT.txt	Aug23 2230-2300Z Primary data
1_2330BT.txt	Aug23 2300-2330Z Beacon data
1_2330RT.txt	Aug23 2300-2330Z Primary data
1_0000BT.txt	Aug23 2330-0000Z Beacon data
1_0000RT.txt	Aug23 2330-0000Z Primary data
1_0030BT.txt	Aug24 0000-0030Z Beacon data
1_0030RT.txt	Aug24 0000-0030Z Primary data
1_0050BT.txt	Aug24 0030-0050Z Beacon data
1_0050RT.txt	Aug24 0030-0050Z Primary data
1_0130BT.txt	Aug24 0050-0130Z Beacon data
1_0130RT.txt	Aug24 0050-0130Z Primary data
1_0200BT.txt	Aug24 0130-0200Z Beacon data
1_0200RT.txt	Aug24 0130-0200Z Primary data
1_0230BT.txt	Aug24 0200-0230Z Beacon data
1_0230RT.txt	Aug24 0200-0230Z Primary data

## File Name

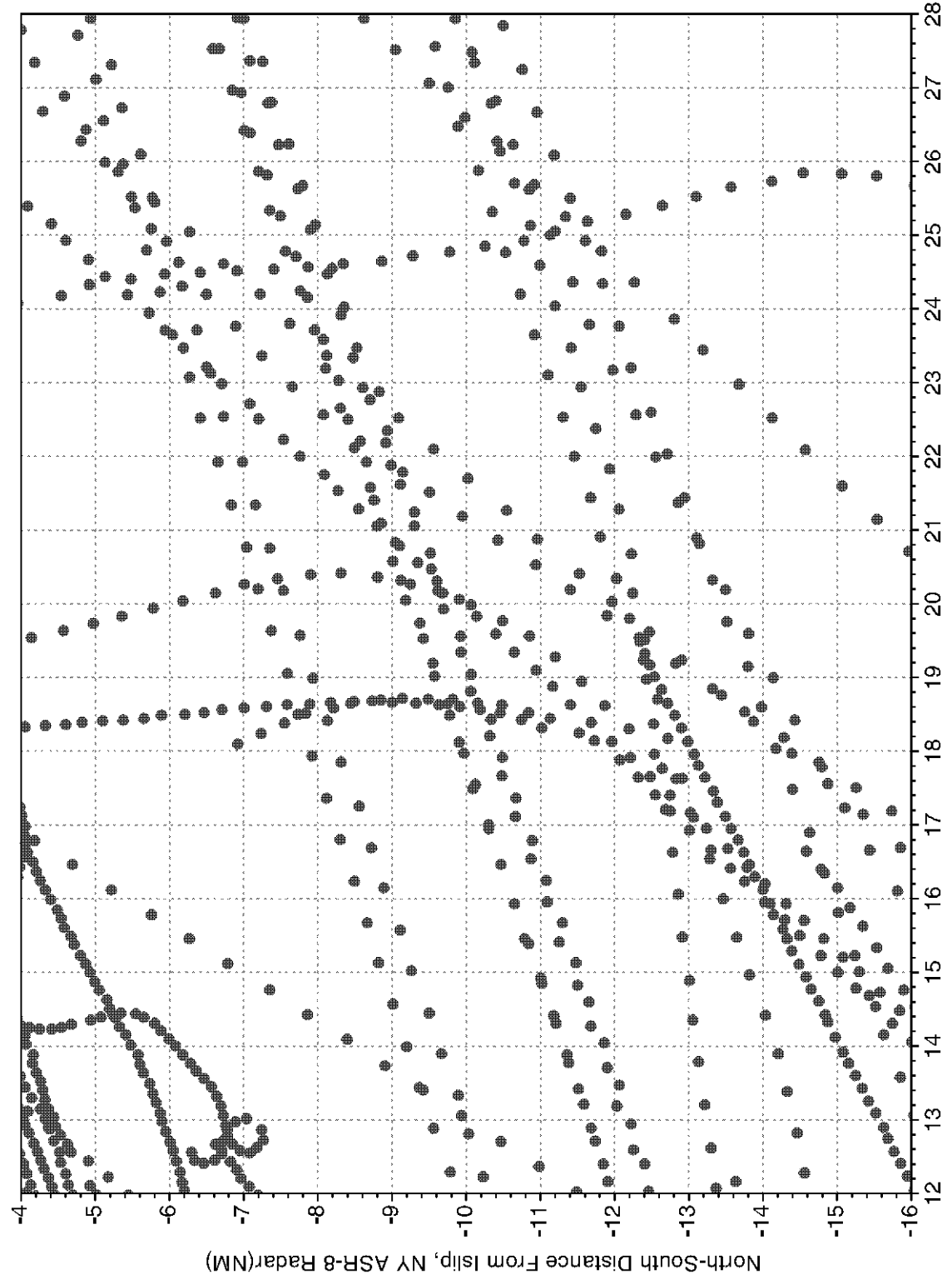
## Content

2_2300BT.txt	Aug24 2230-2300Z Beacon data
2_2300RT.txt	Aug24 2230-2300Z Primary data
2_2330BT.txt	Aug24 2300-2330Z Beacon data
2_2330RT.txt	Aug24 2300-2330Z Primary data
2_0000BT.txt	Aug24 2330-0000Z Beacon data
2_0000RT.txt	Aug24 2330-0000Z Primary data
2_0030BT.txt	Aug25 0000-0030Z Beacon data
2_0030RT.txt	Aug25 0000-0030Z Primary data
2_0050BT.txt	Aug25 0030-0050Z Beacon data
2_0050RT.txt	Aug25 0030-0050Z Primary data
2_0116BT.txt	Aug25 0050-0116Z Beacon data
2_0116RT.txt	Aug25 0050-0116Z Primary data
2_0200BT.txt	Aug25 0116-0200Z Beacon data
2_0200RT.txt	Aug25 0116-0200Z Primary data
2_0230BT.txt	Aug25 0200-0230Z Beacon data
2_0230RT.txt	Aug25 0200-0230Z Primary data



# ISLIP ASR-8 Radar Aug23 2230-2300(Z), 1999 BT

BT

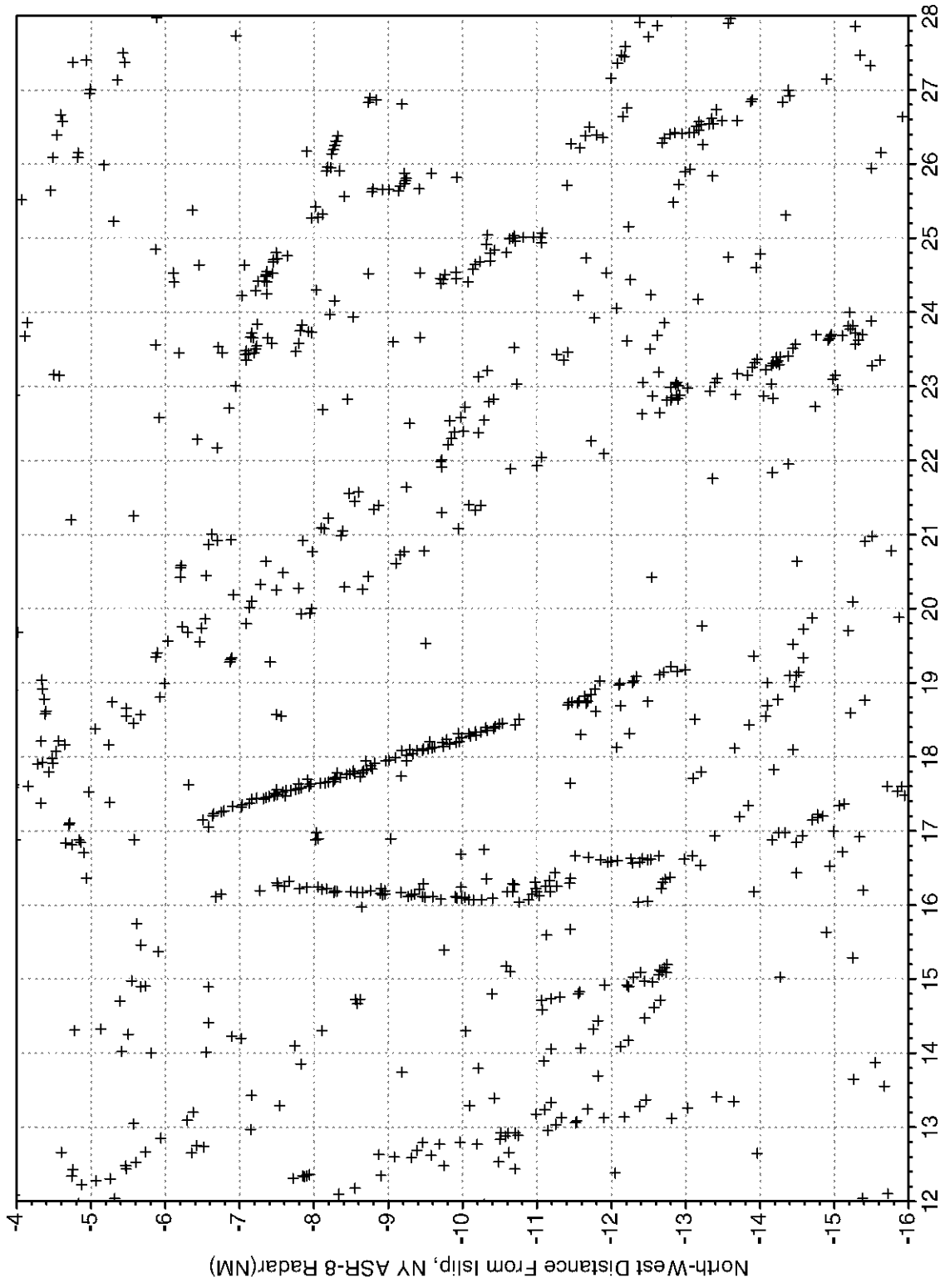


North-South Distance From Islip, NY ASR-8 Radar(NM)

East-West Distance From Islip, NY ASR-8 Radar(NM)

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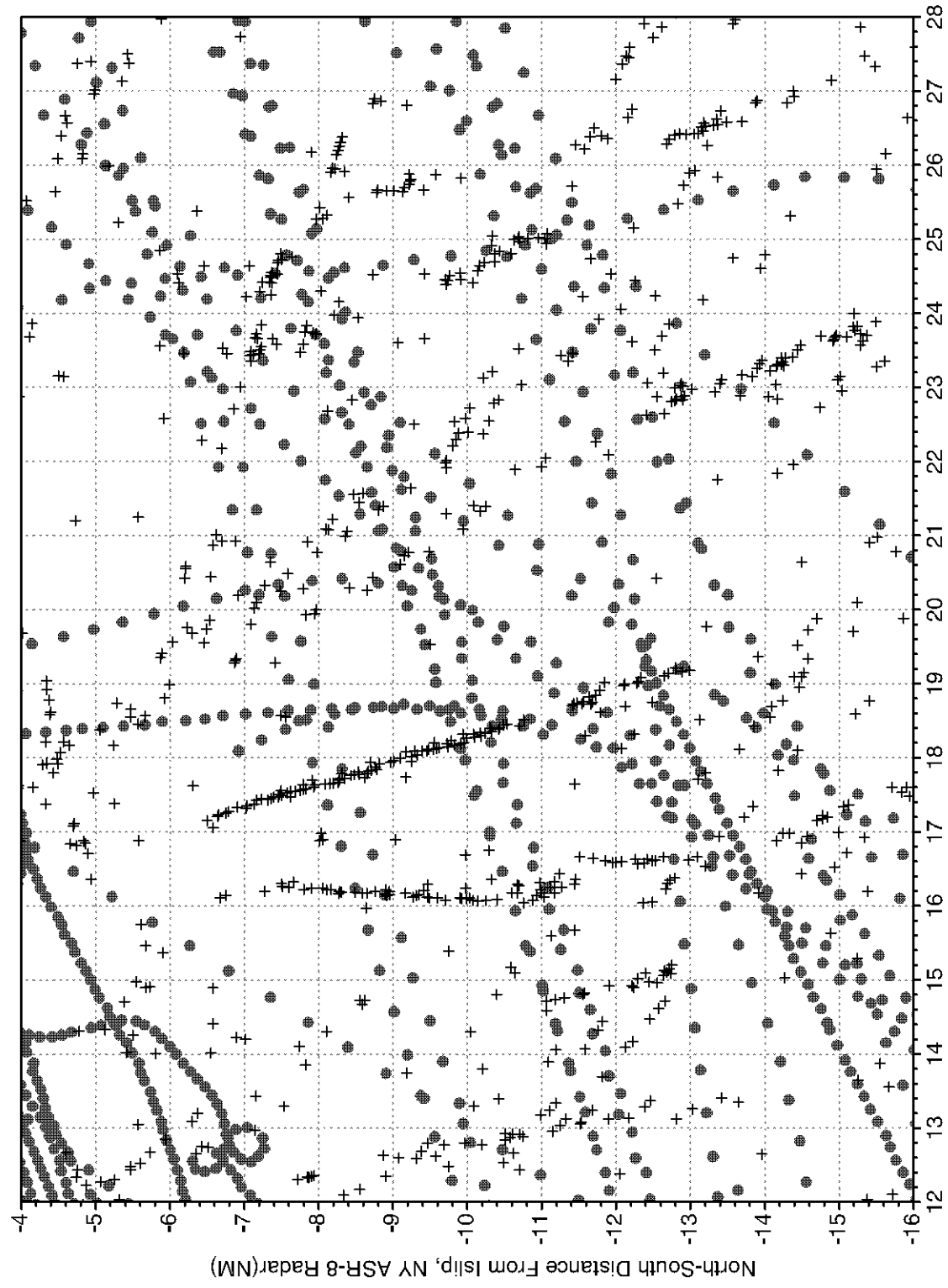
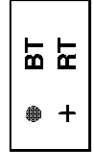
+ RT



East-West Distance From Islip, NY ASR-8 Radar(NM)

10

# ISLIP ASR-8 Aug23 2230-2300(Z), 1999 RT and BT

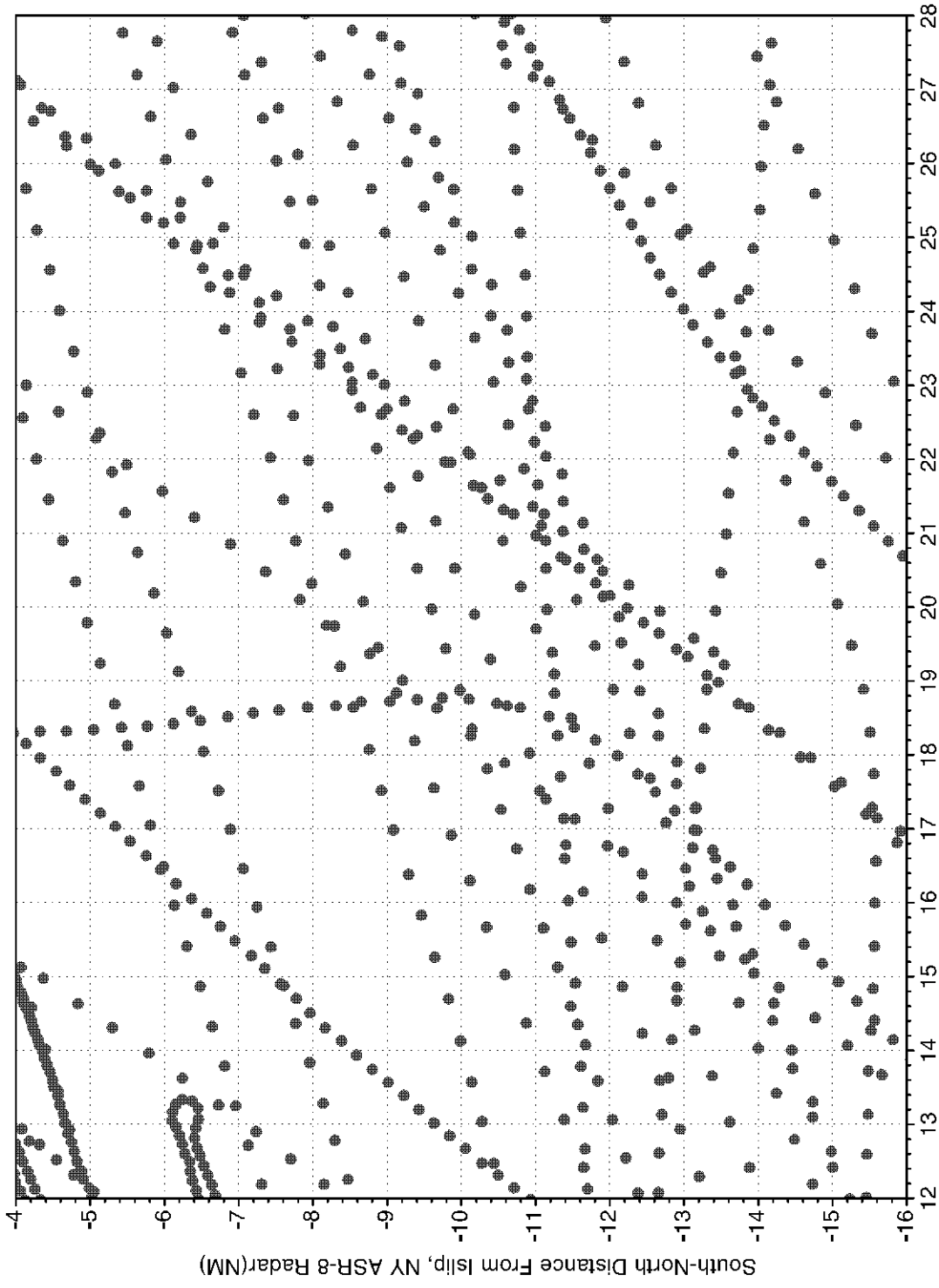


East-West Distance From Islip, NY ASR-8 Radar(NM)

11

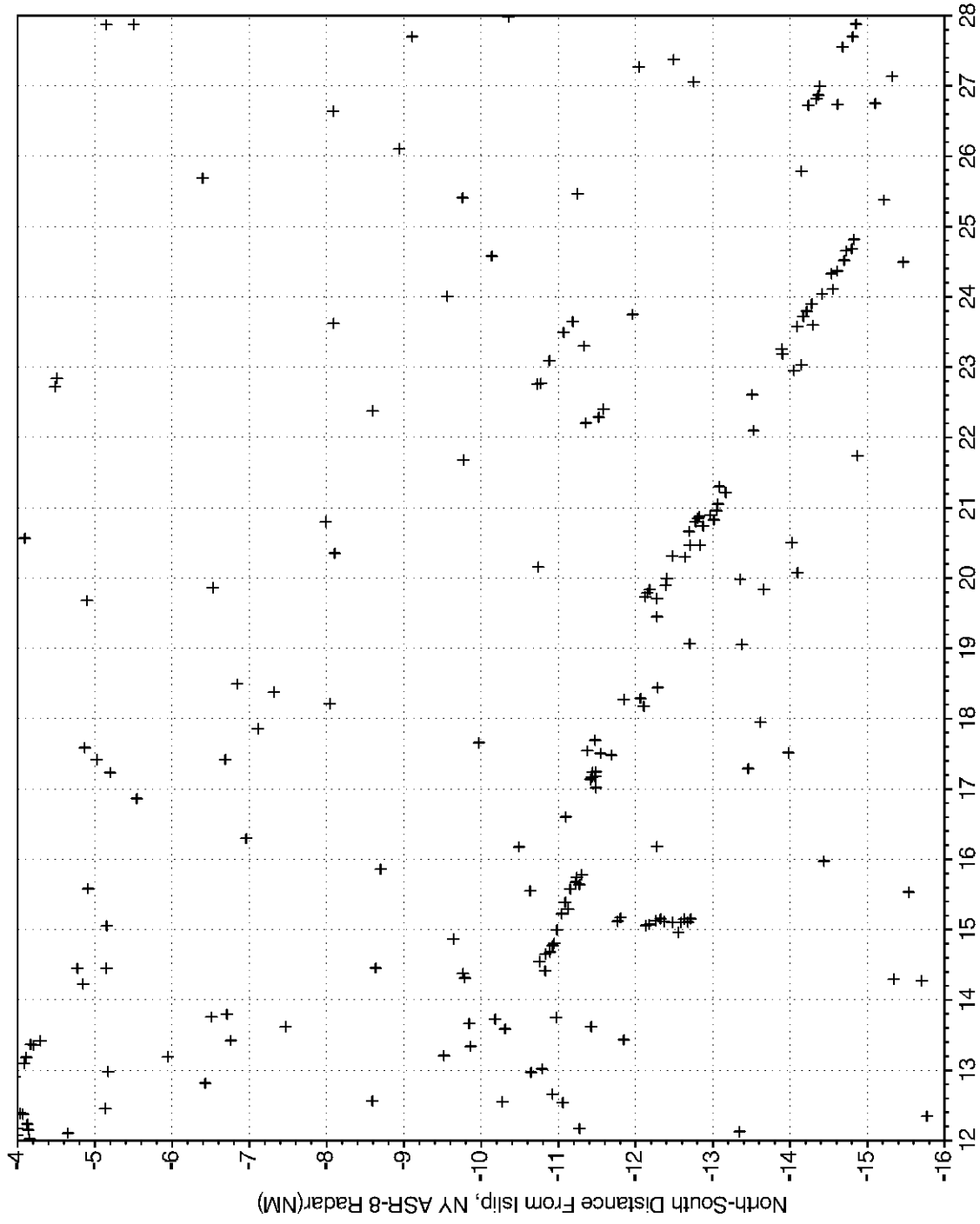
ISLIP ASR-8 Radar Aug23 2300-2330(Z), 1999 BT

• BT



ISLIP ASR-8 Radar Aug23 2300-2330(Z), 1999 RT

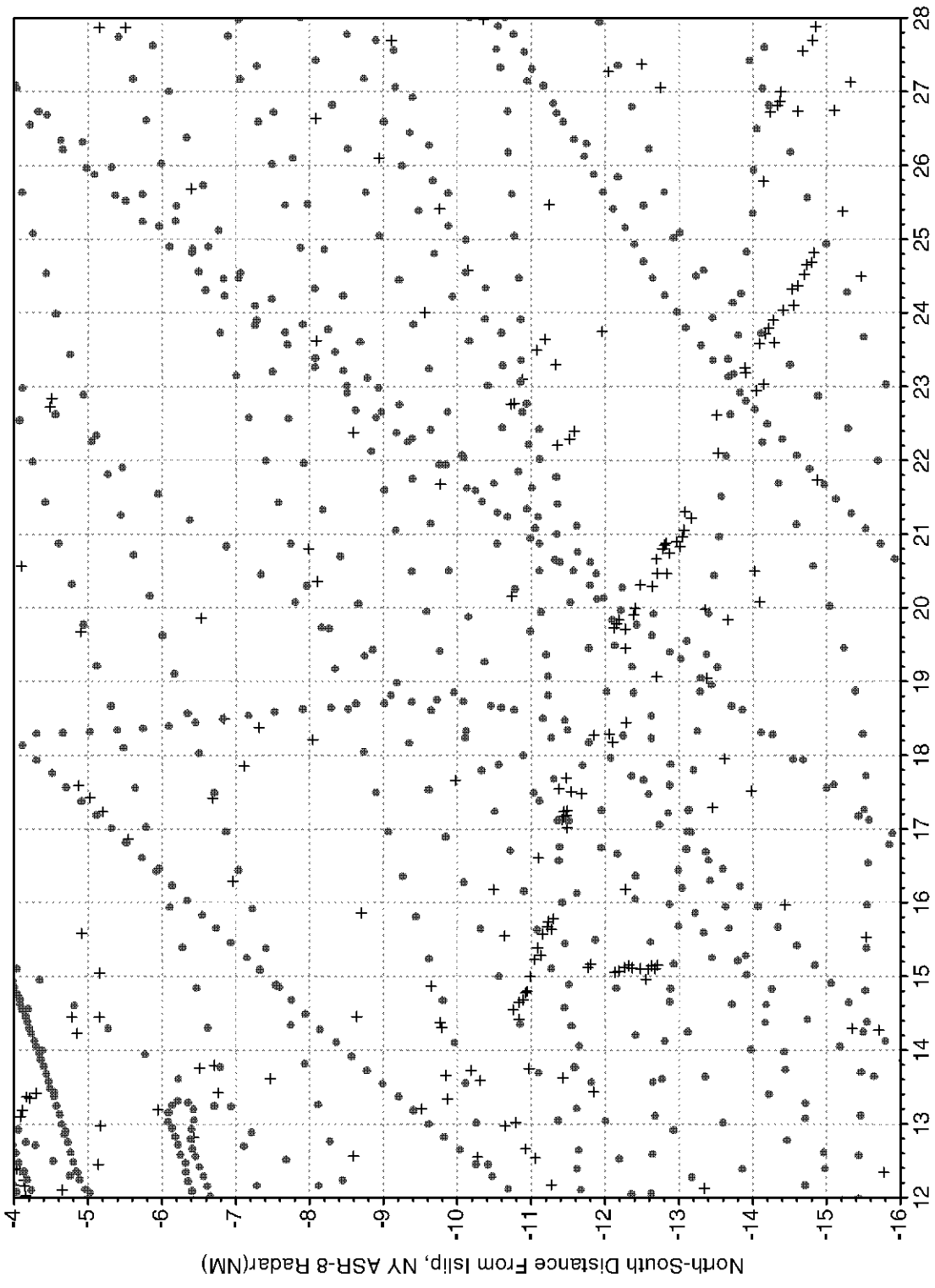
+ RT



East-West Distance From Islip, NY ASR-8 Radar (NM)

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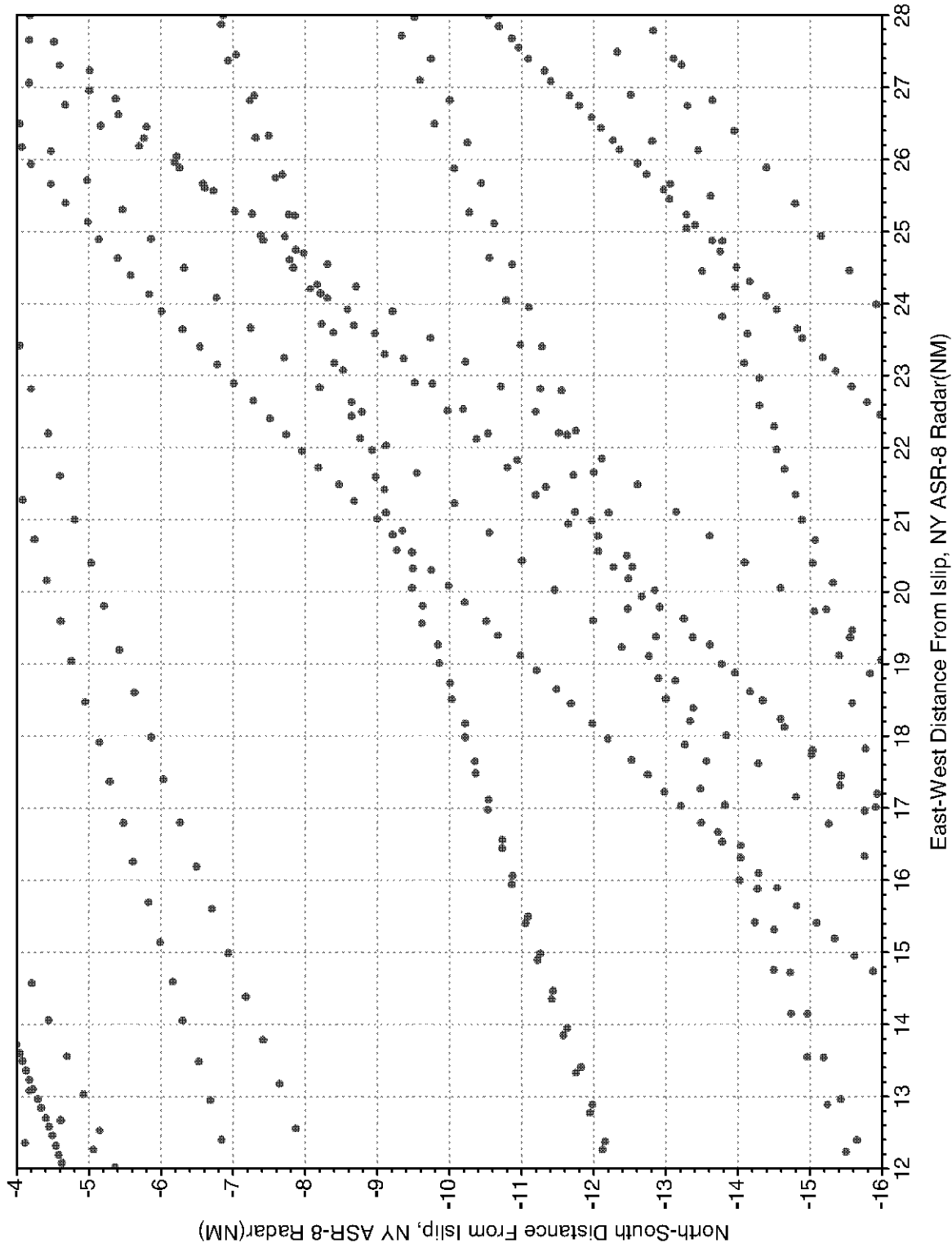
+ RT  
• BT



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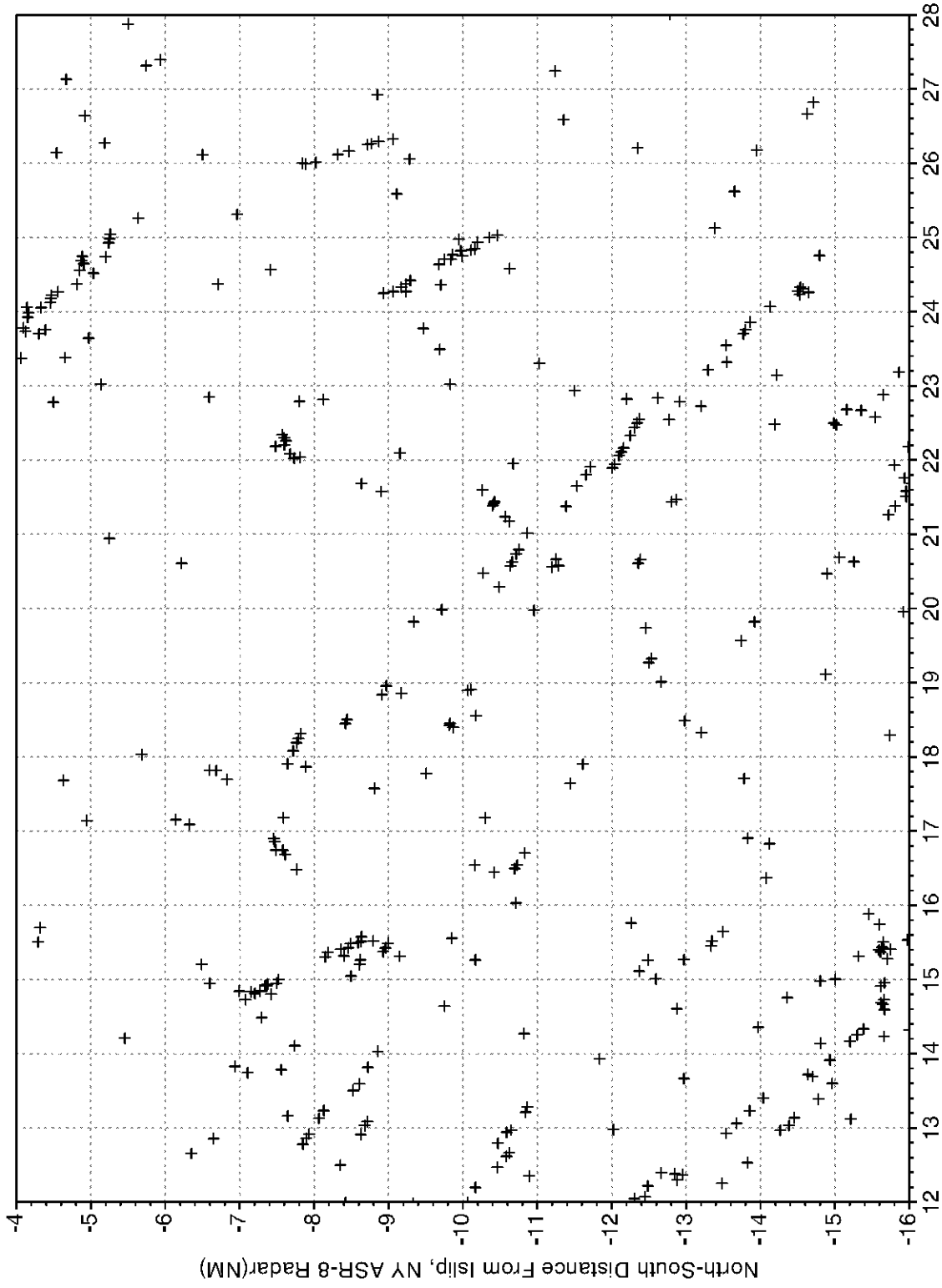
ISLIP ASR-8 Radar Aug23 2330-0000(Z), 1999 BT

BT



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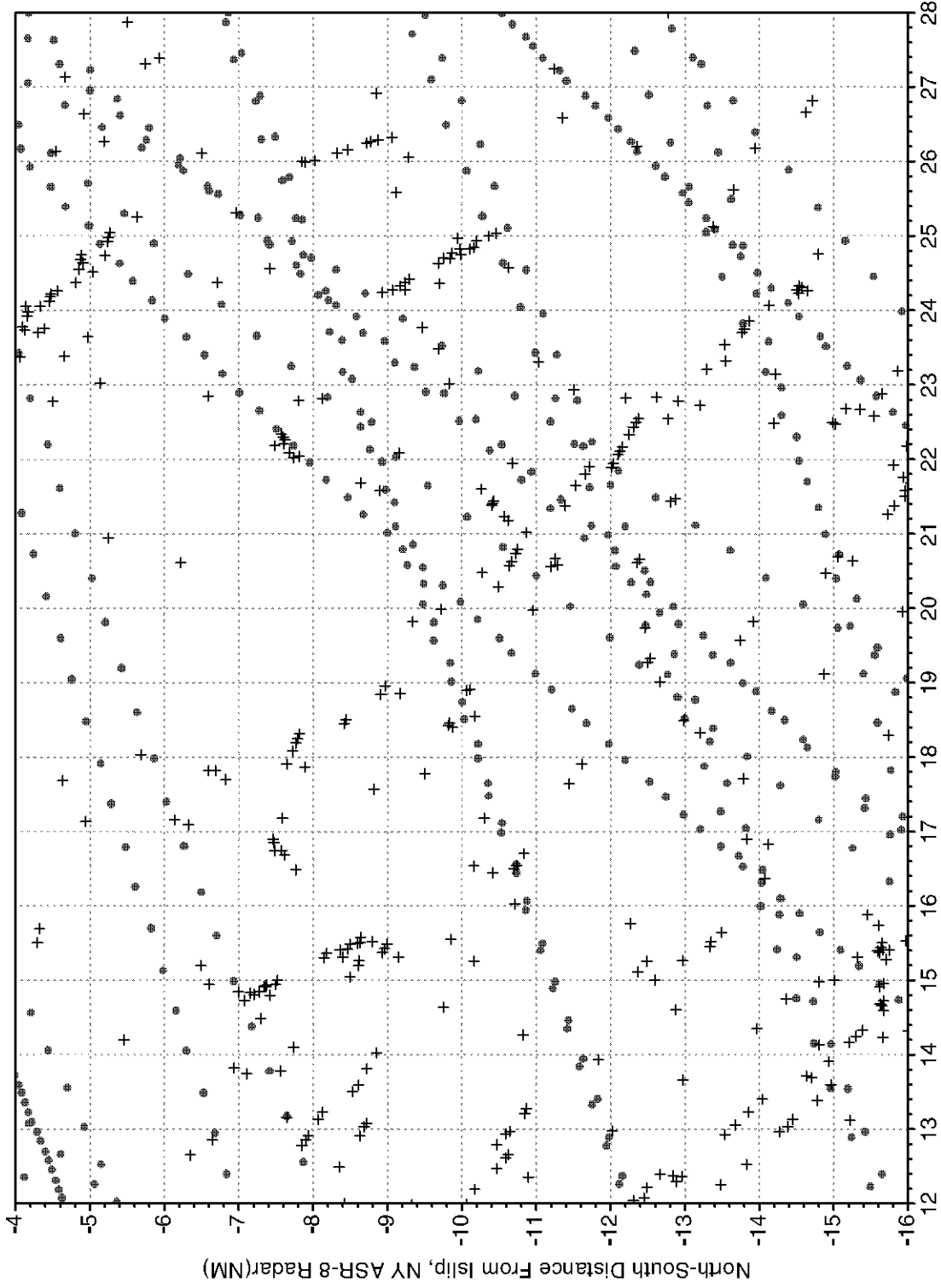
+ RT





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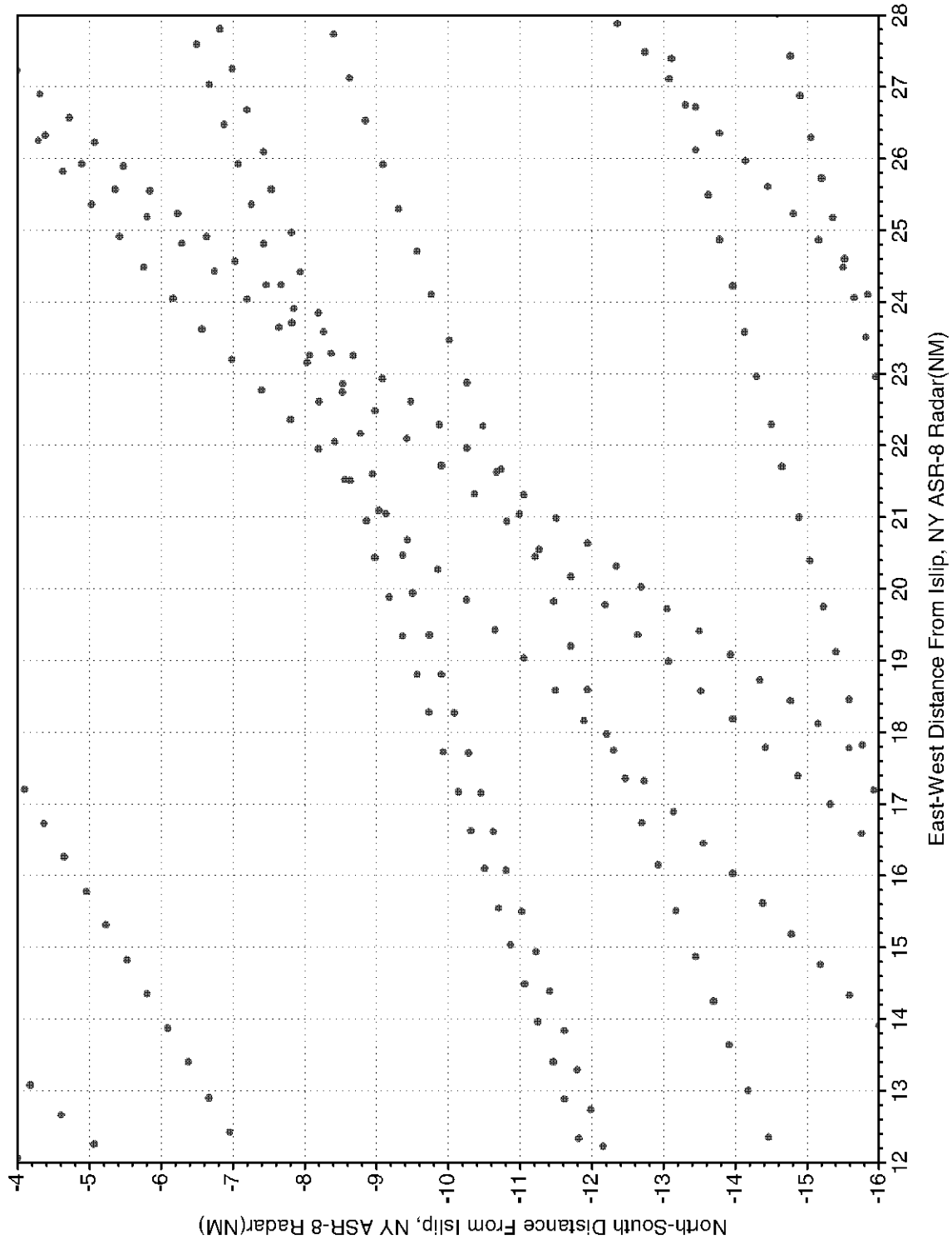
BT  
+



East-West Distance From Islip, NY ASR-8 Radar(NM)

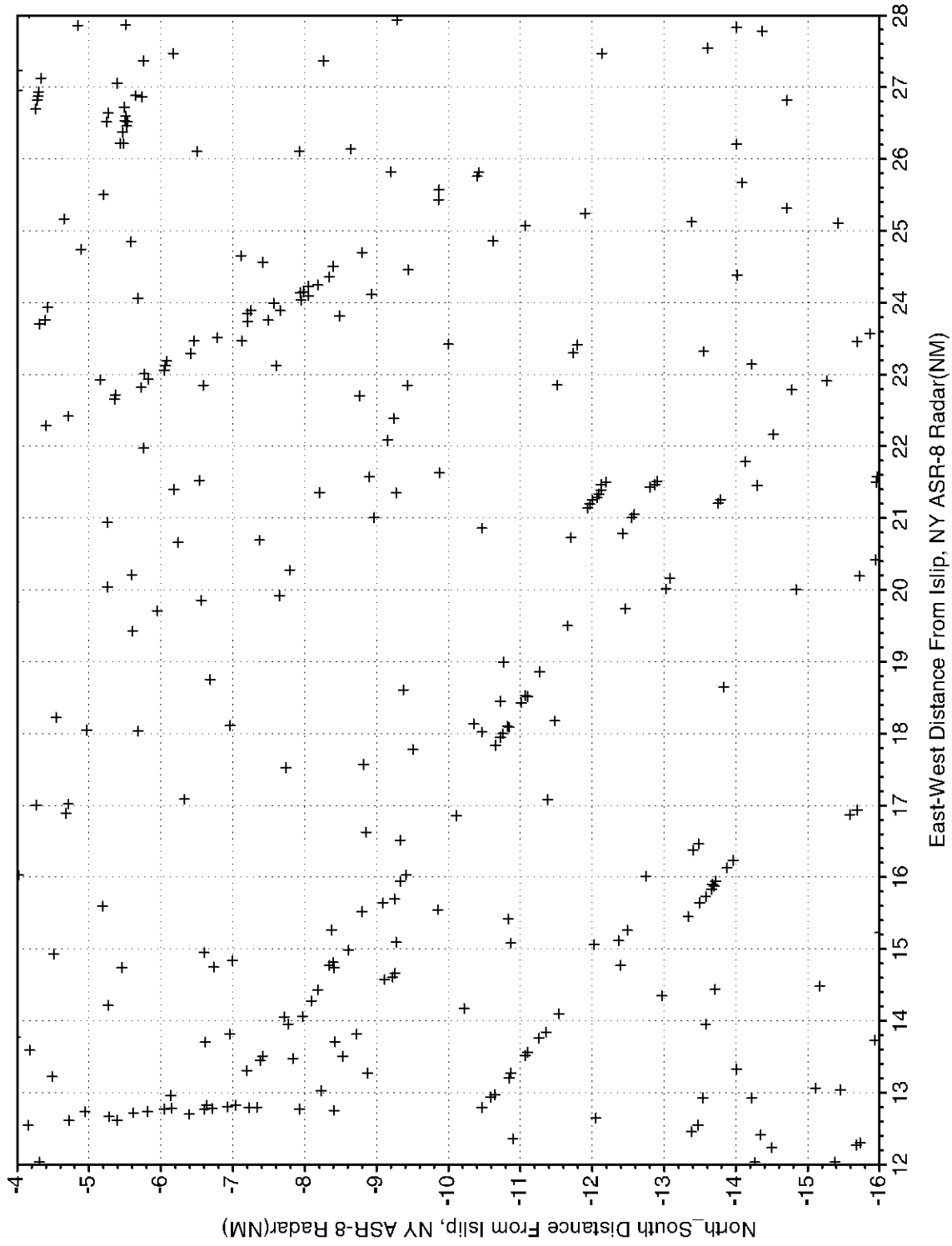
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BT



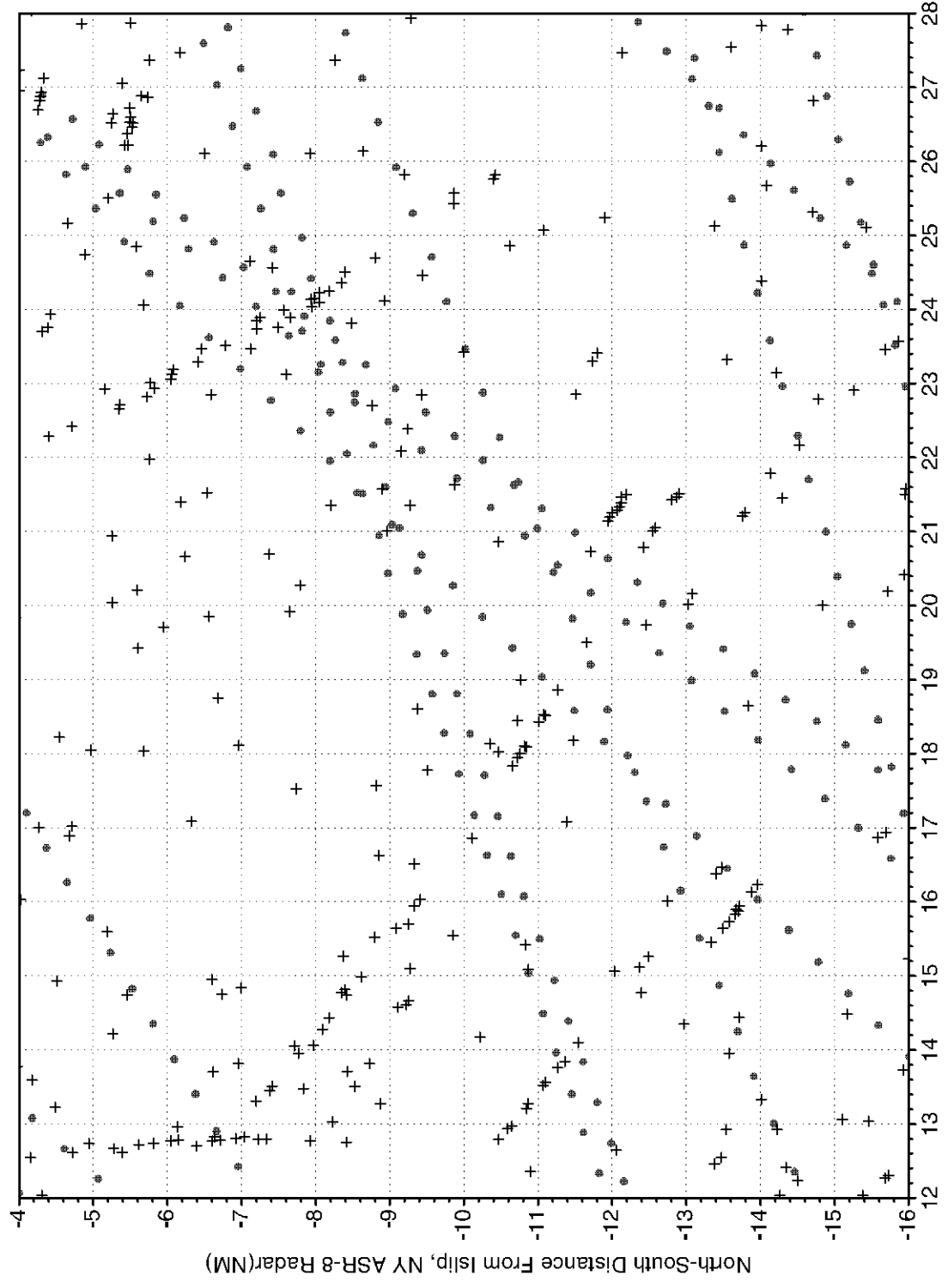
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+ RT



# ISLIP ASR-8 Radar Aug24 0000-0030(Z), 1999 RT and BT

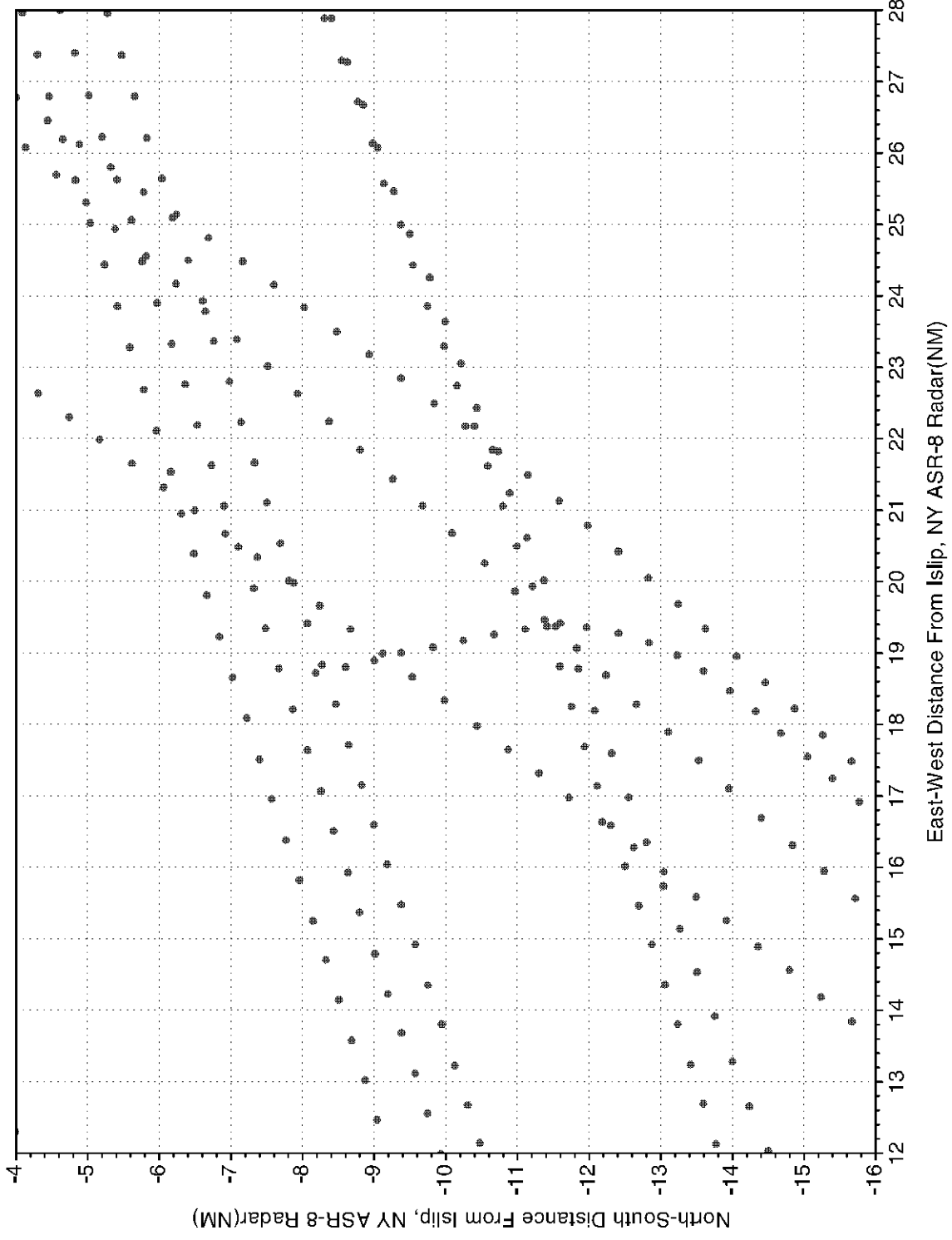
● BT  
+ RT



East-West Distance From Islip, NY ASR-8 Radar(NM)

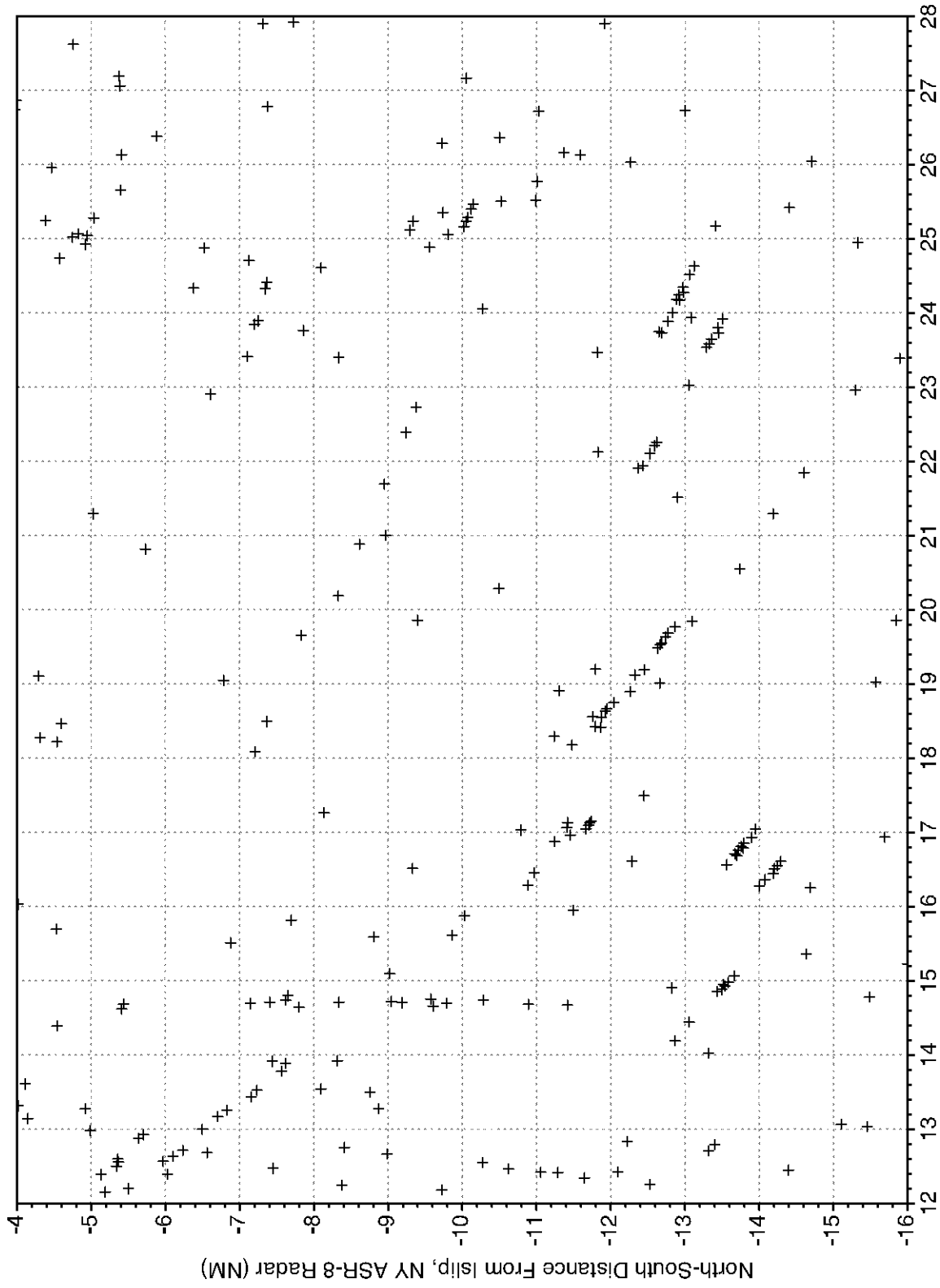
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BT

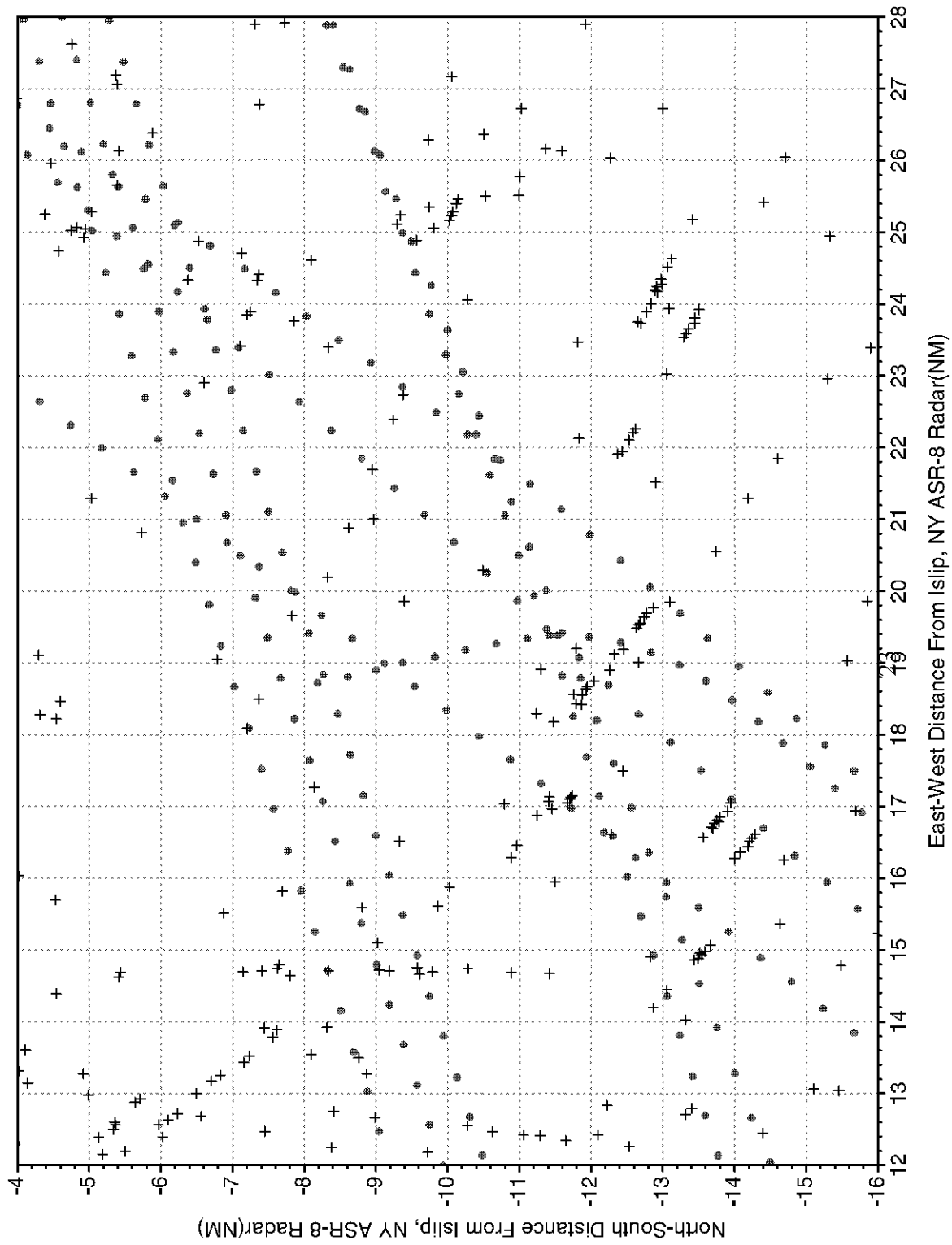
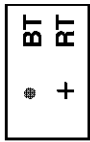


# ISLIP ASR-8 Radar Aug24 0030-0050(Z), 1999 RT

+ RT

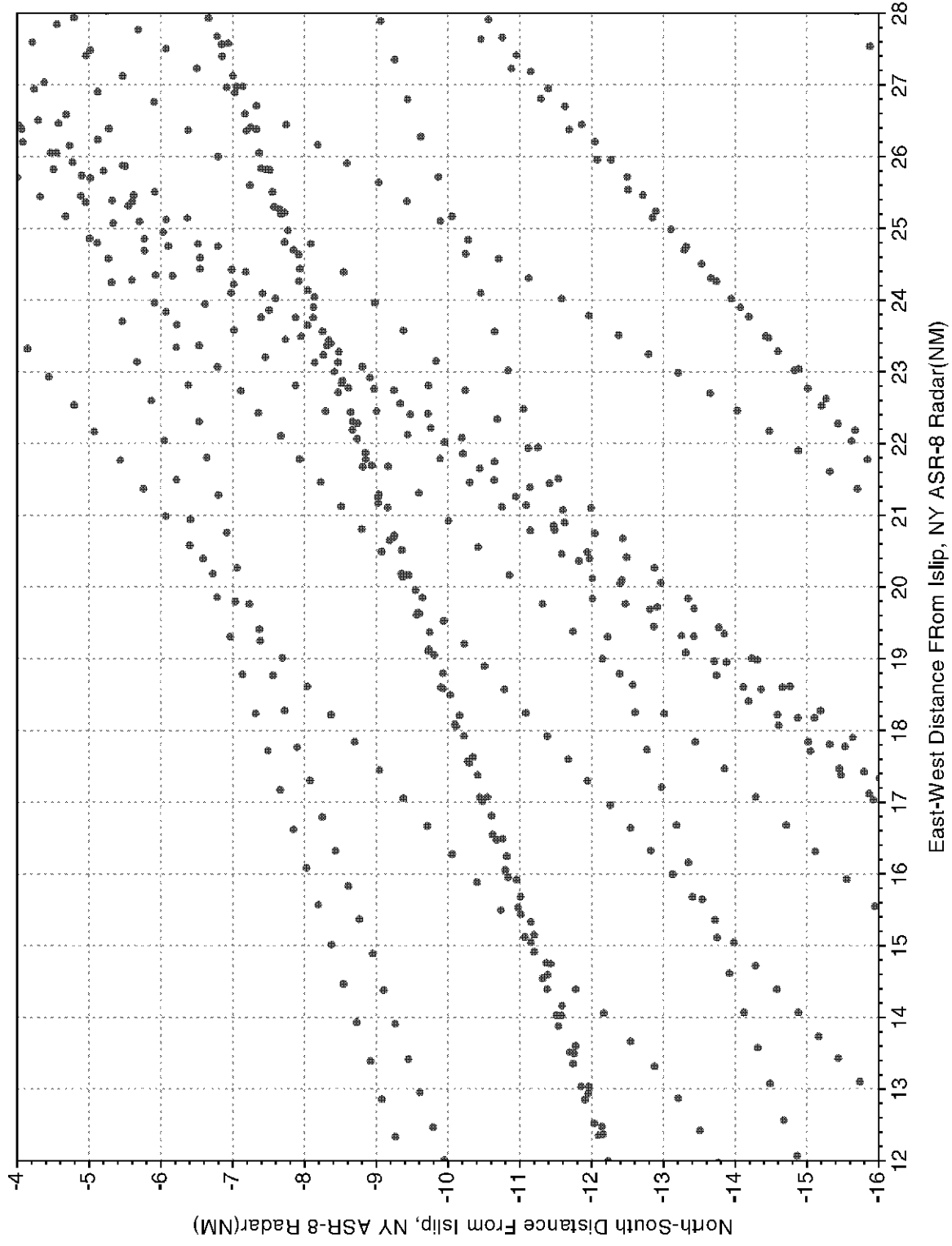


# ISLIP ASR-8 Radar Aug24 0030-0050(Z), 1999 RT and BT



# ISLIP ASR-8 Radar Aug24 0051-0130(Z), 1999 BT

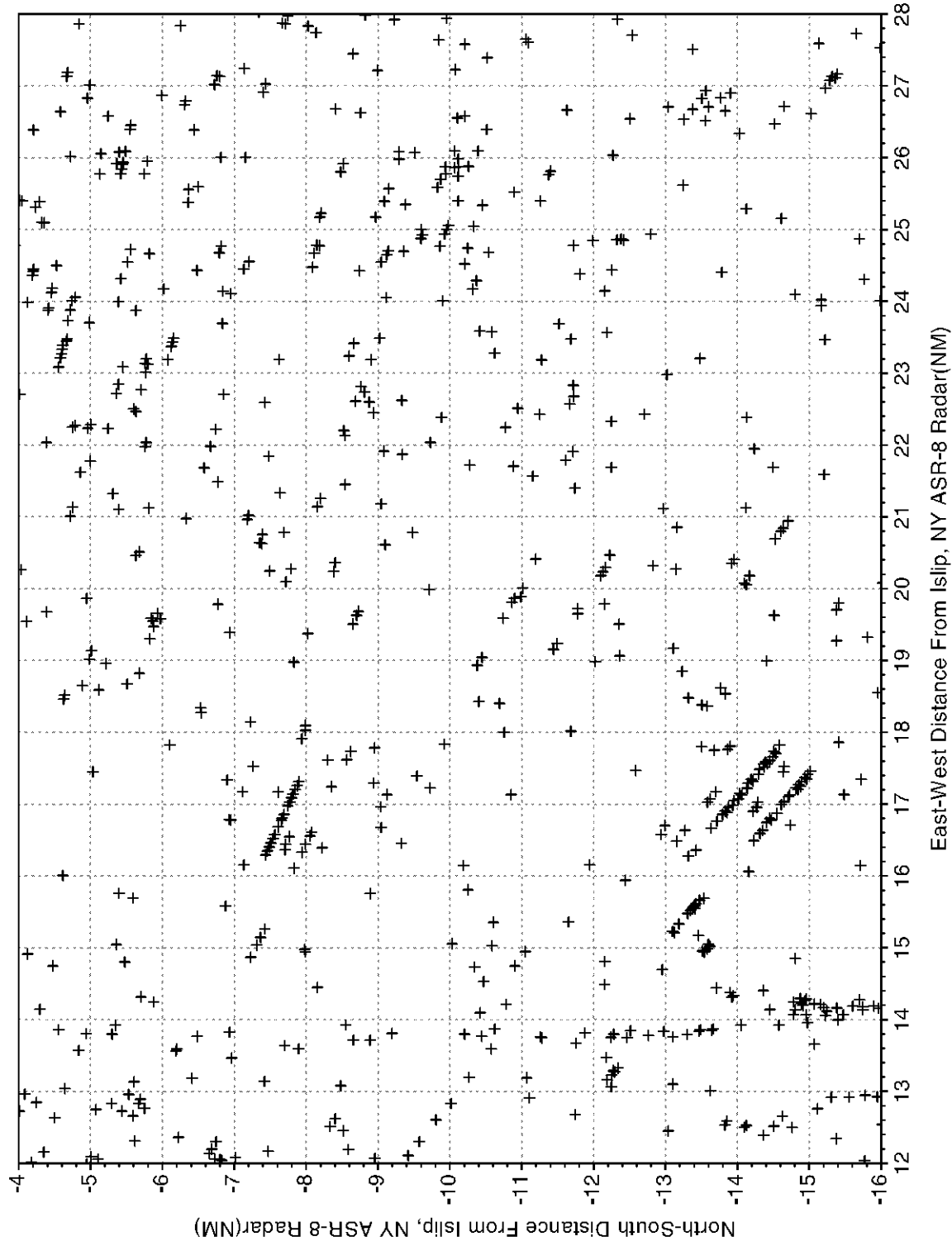
BT





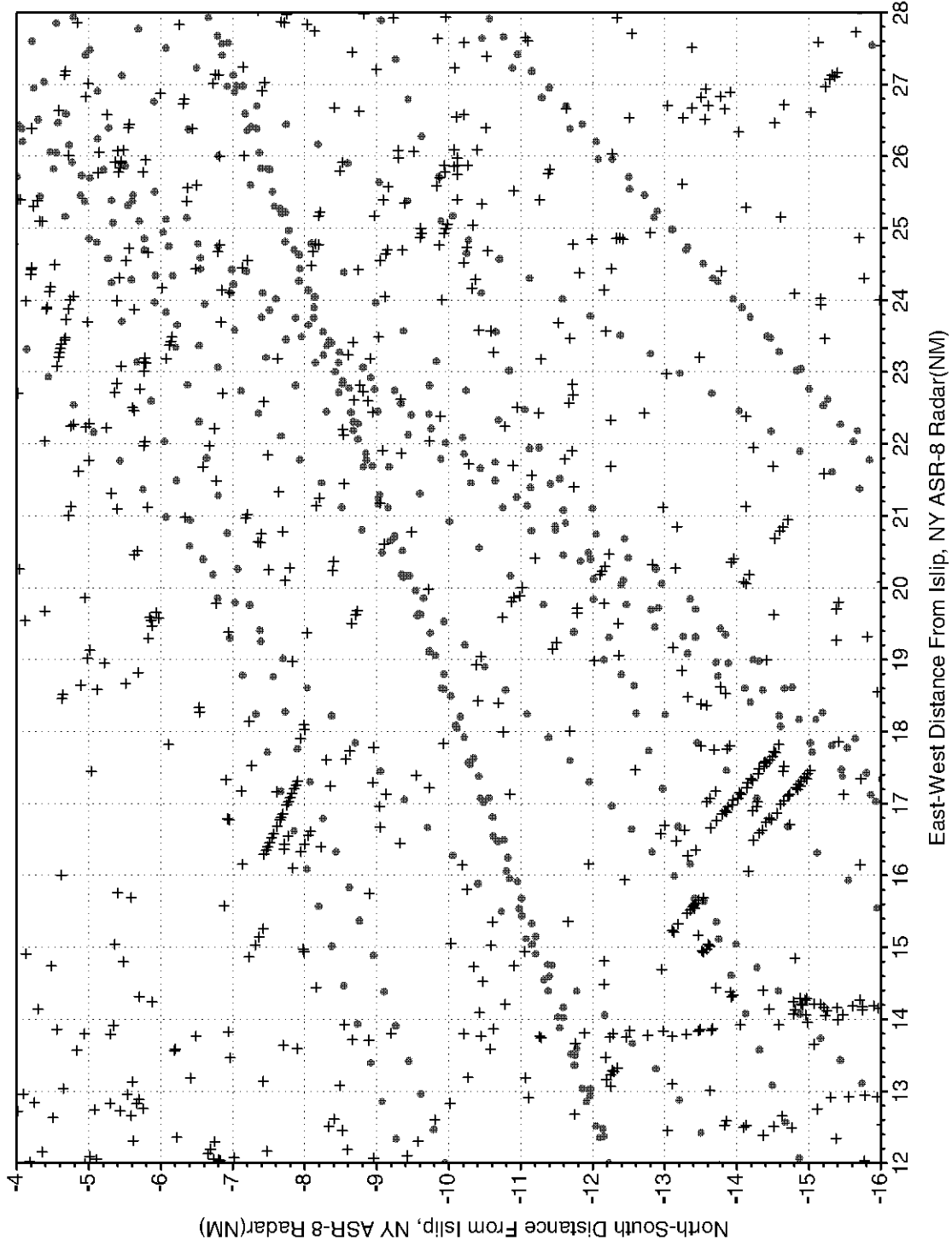
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+ RT



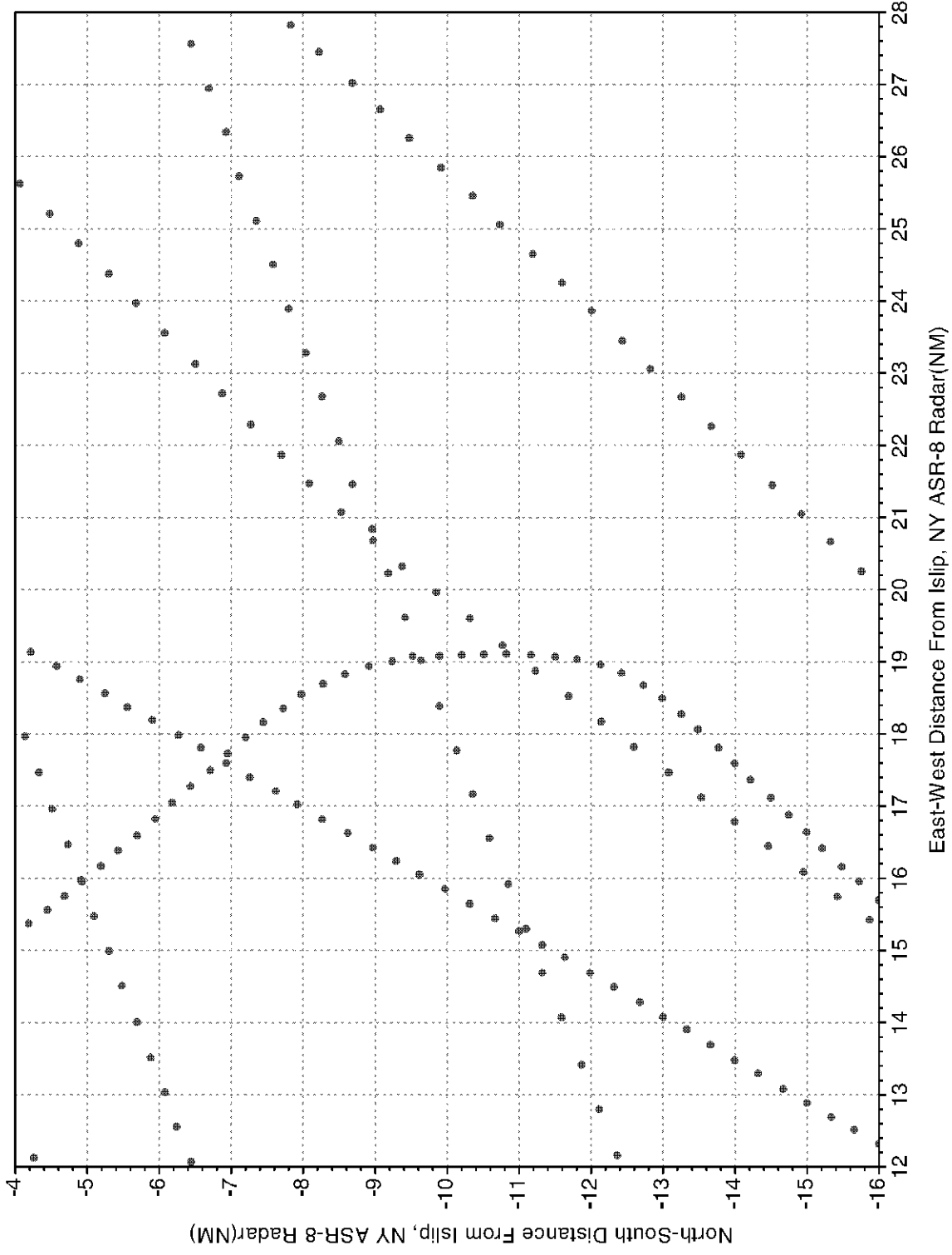
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BT  
+ RT



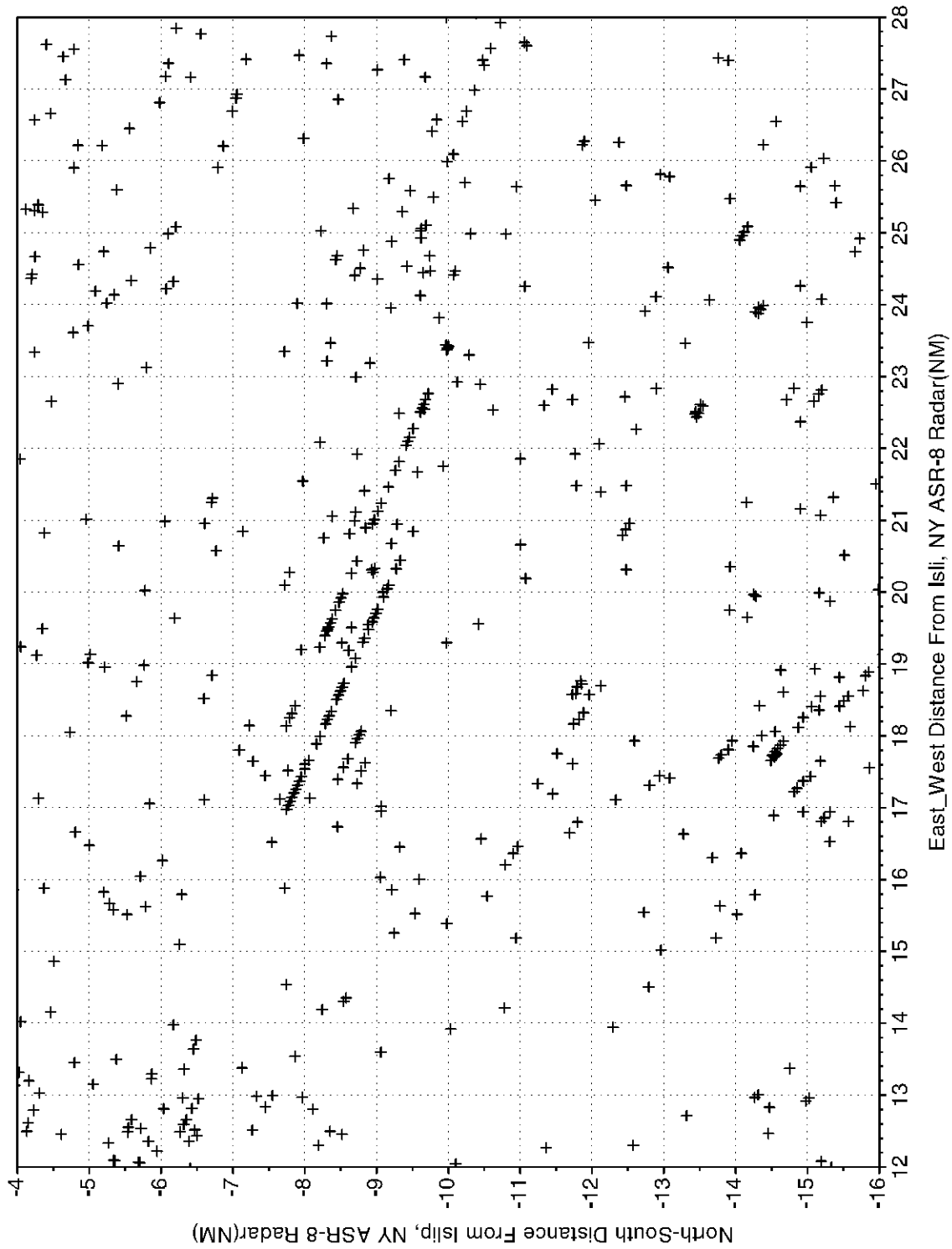
ISLIP ASR-8 Radar Aug24 0130-0200(Z), 1999 BT

BT



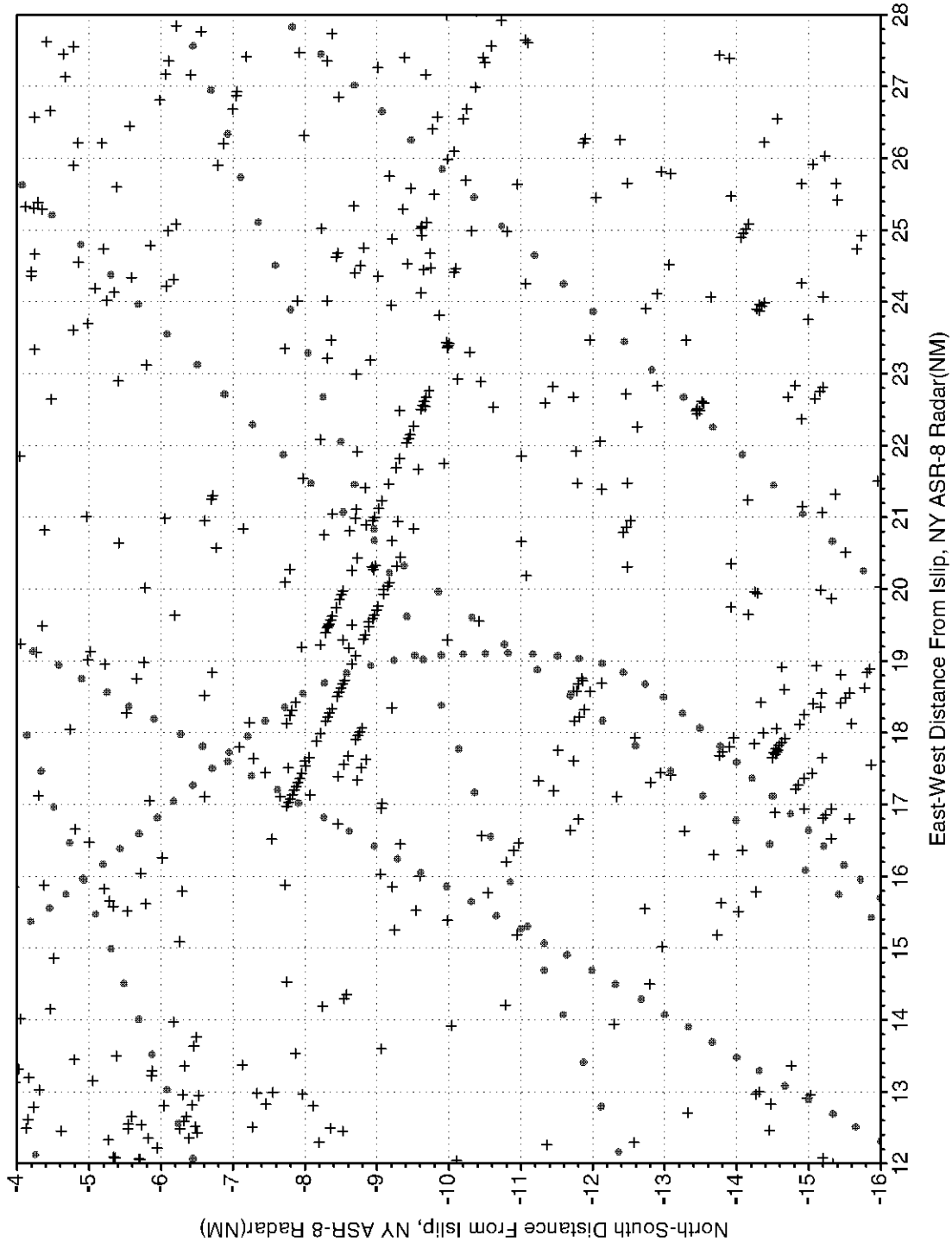
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+ RT



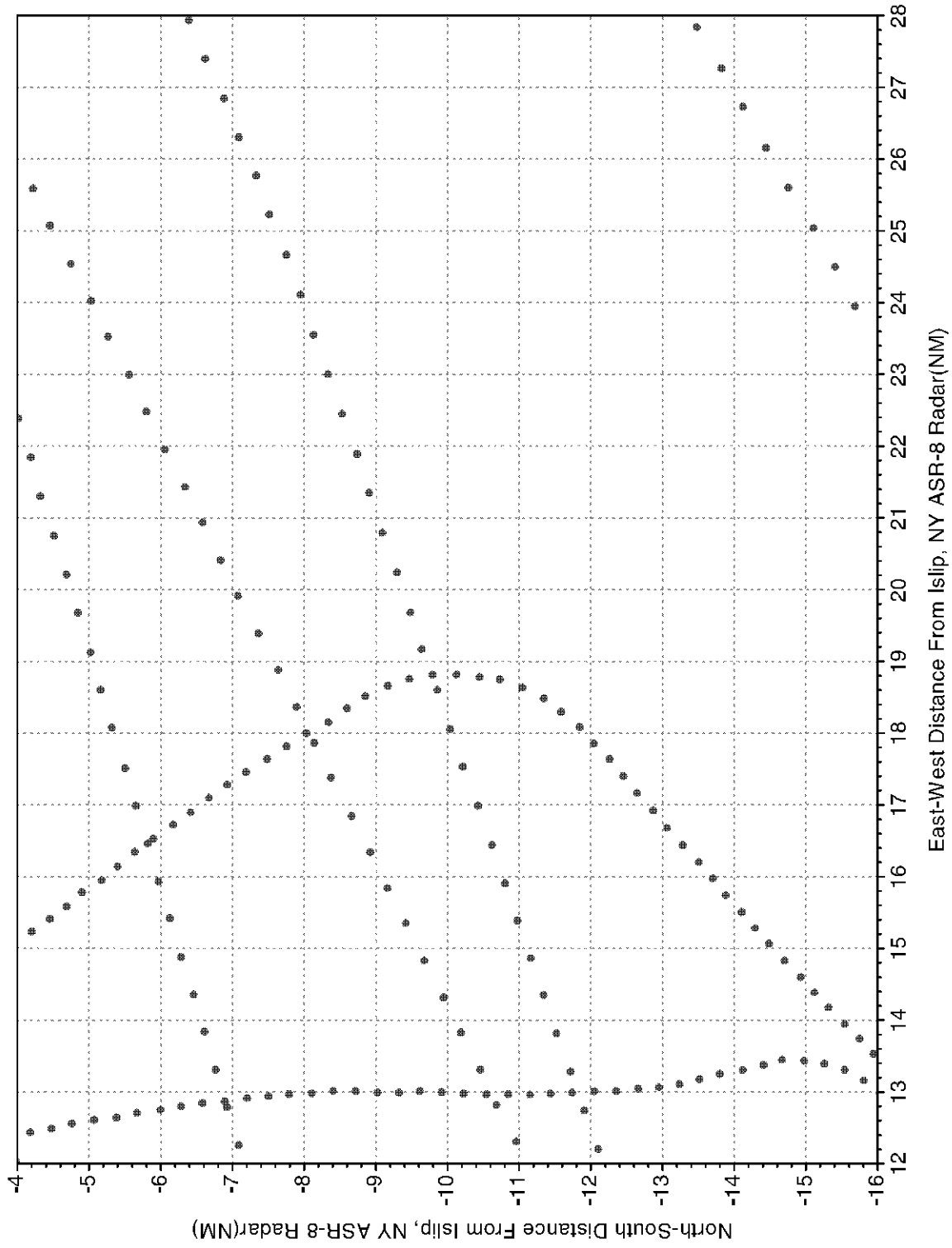
ISLIP ASR-8 RADAR Aug24 0130-0200(Z), 1999 BT and RT

+ RT  
• BT



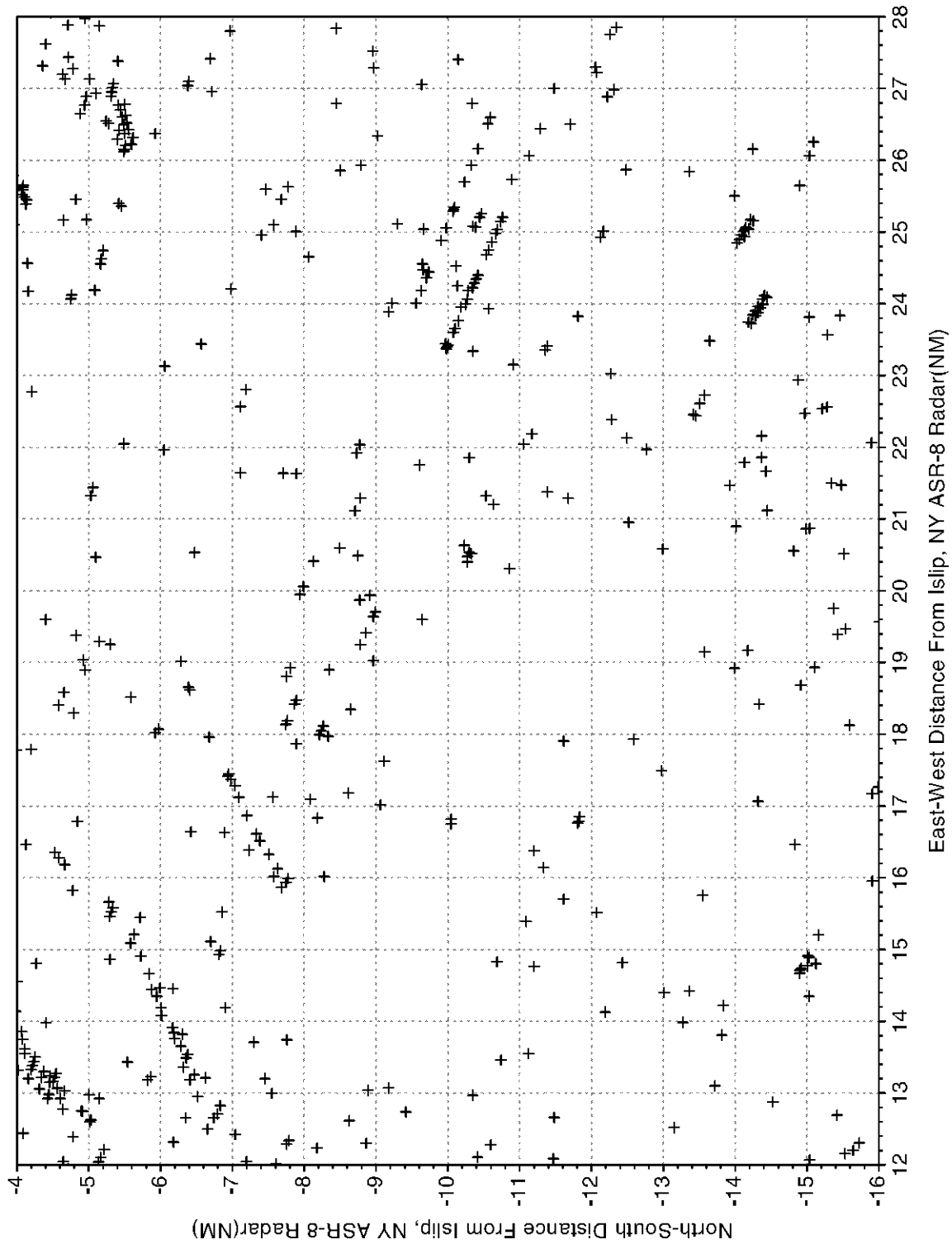
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BT



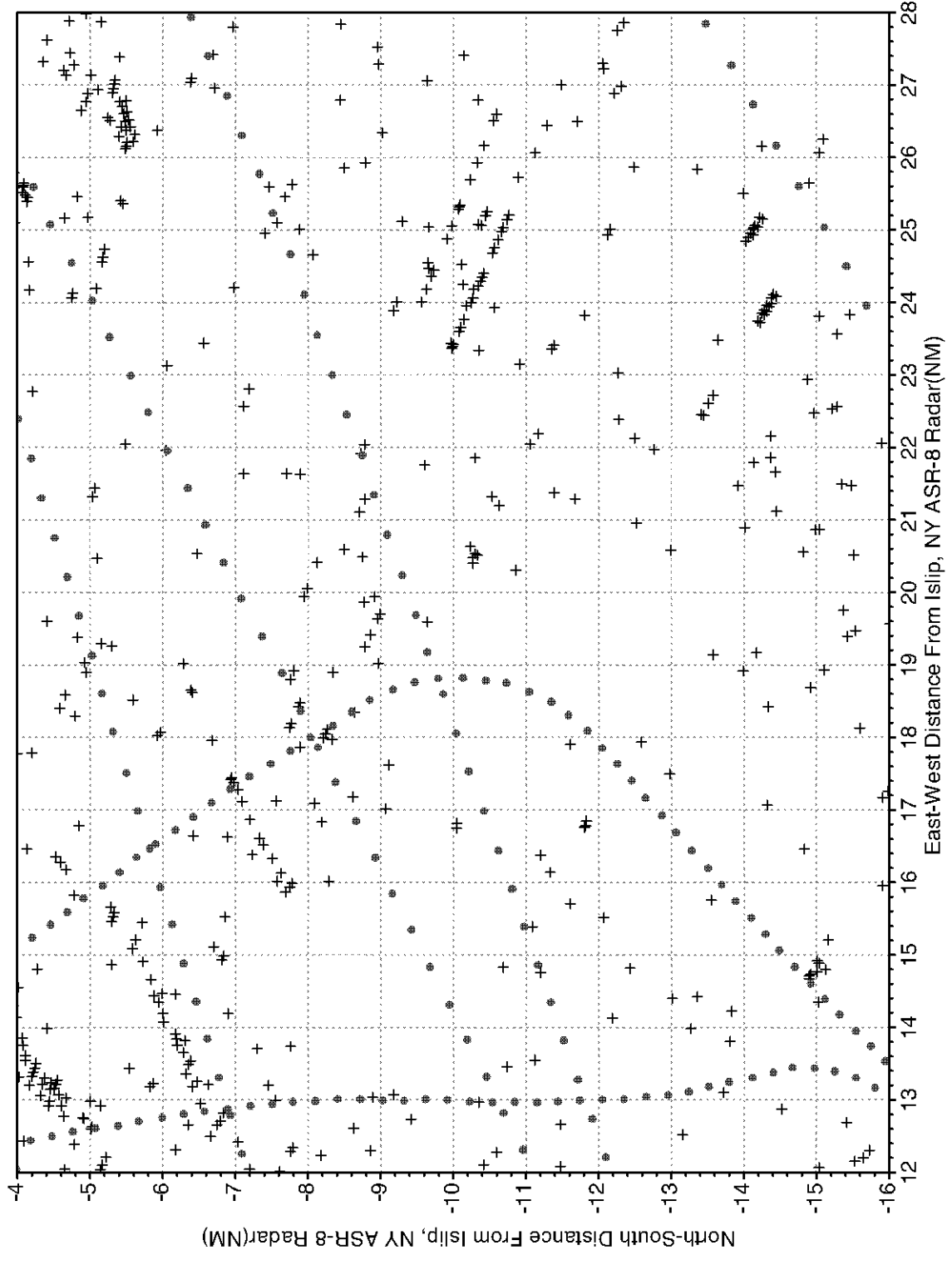
ISLIP ASR-8 Radar Aug24 0200-0230(Z), 1999 RT

+ RT



# ISLIP ASR-8 Aug24 0200-0230(Z), 1999 RT and BT

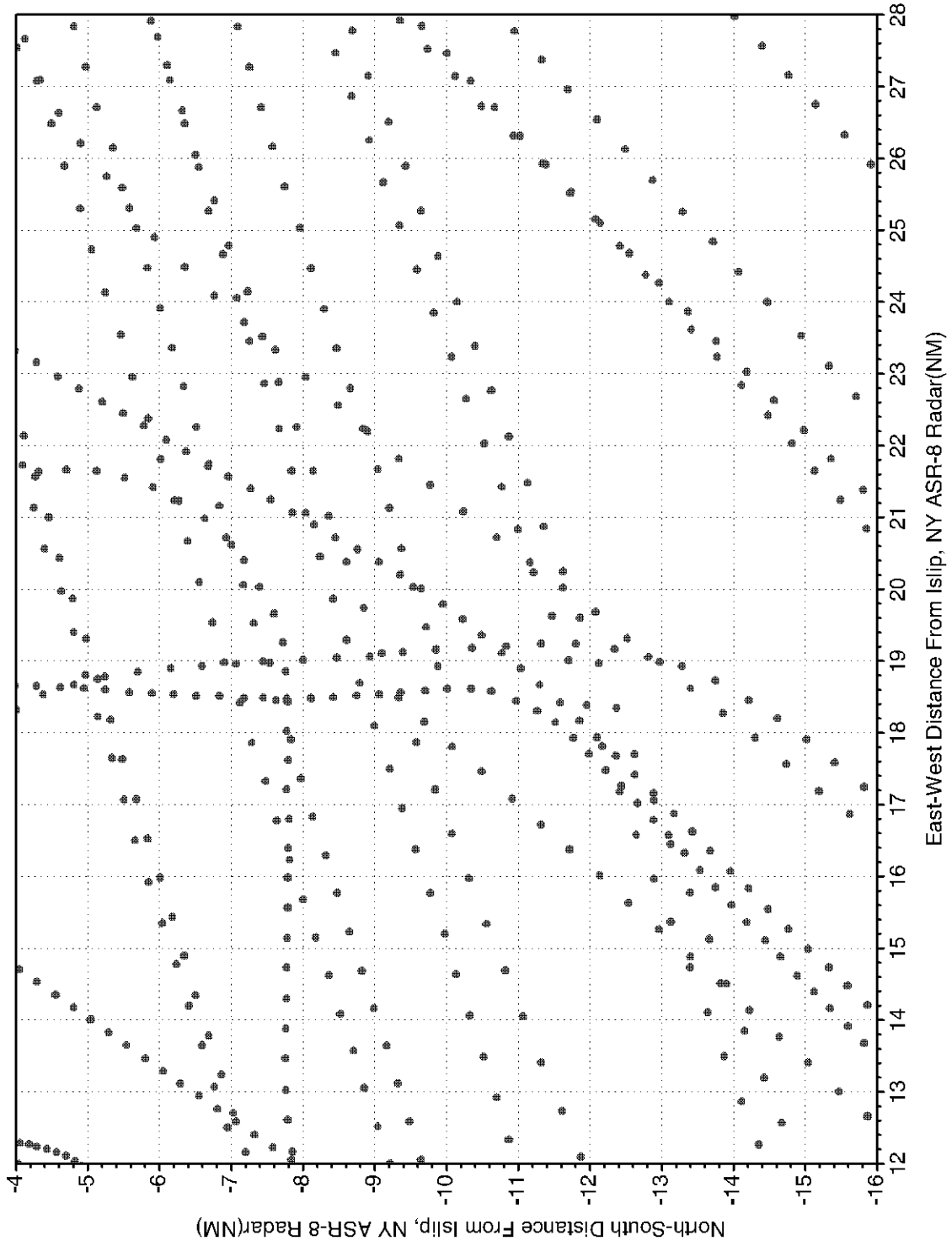
+ RT  
● BT





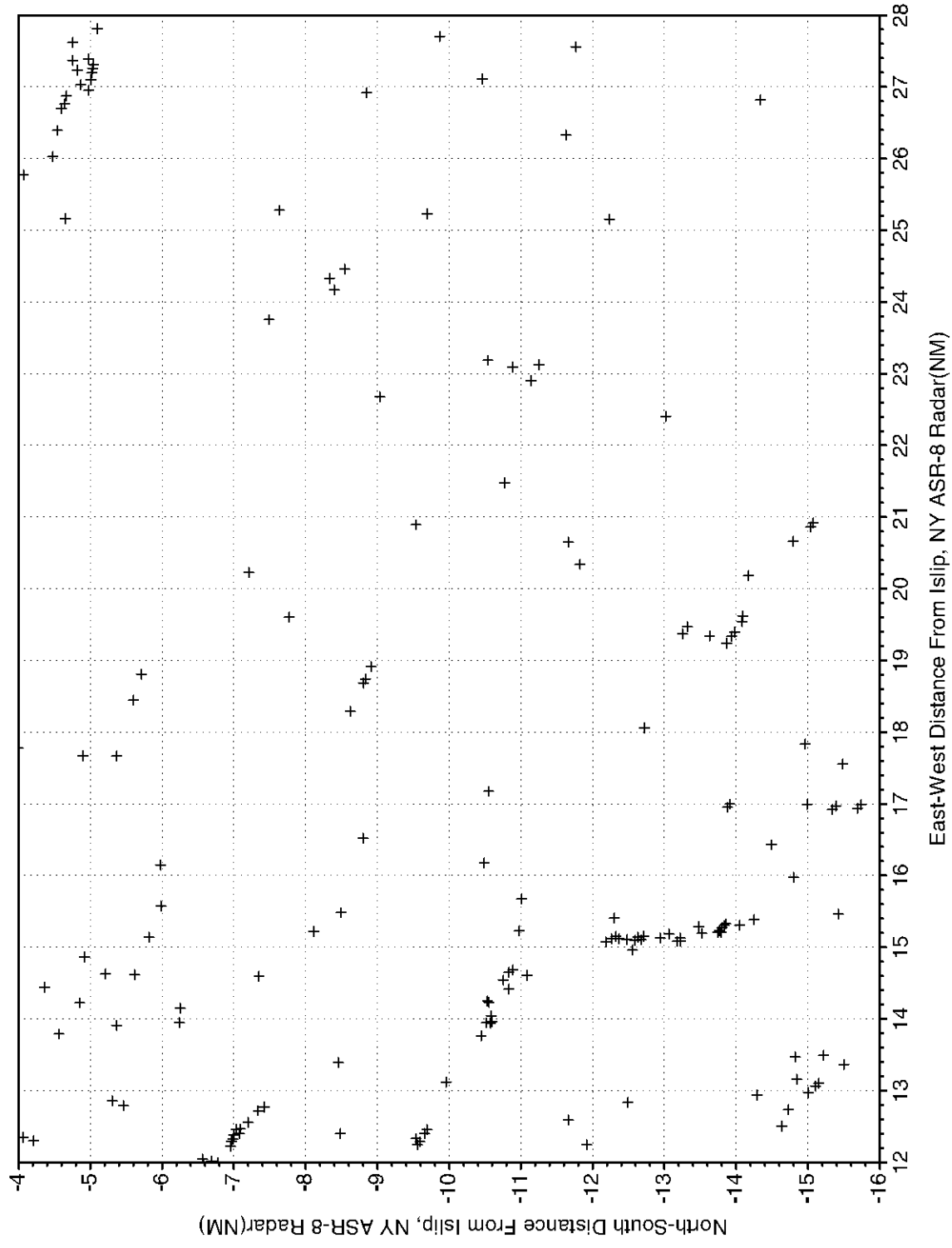
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BT



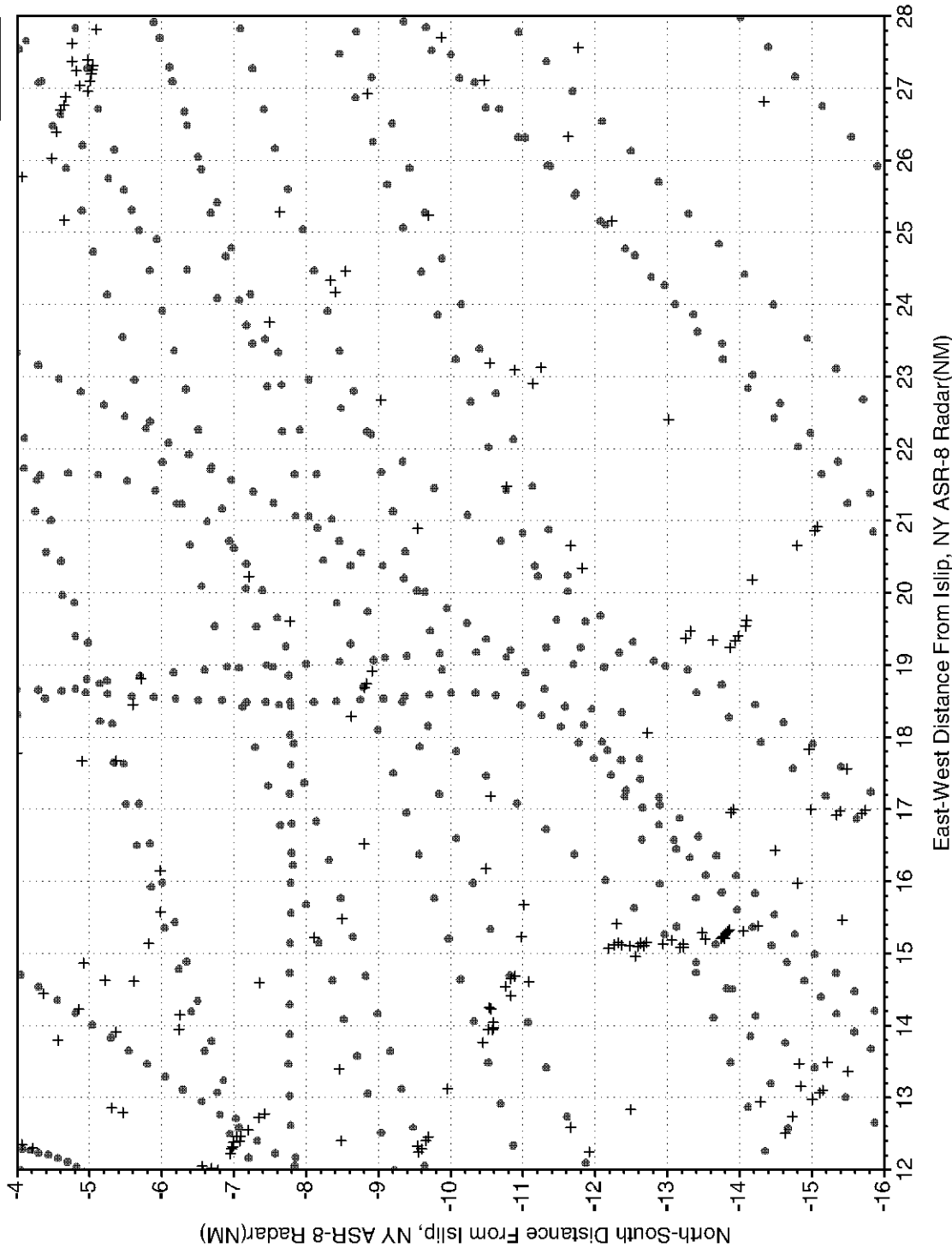
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+ RT



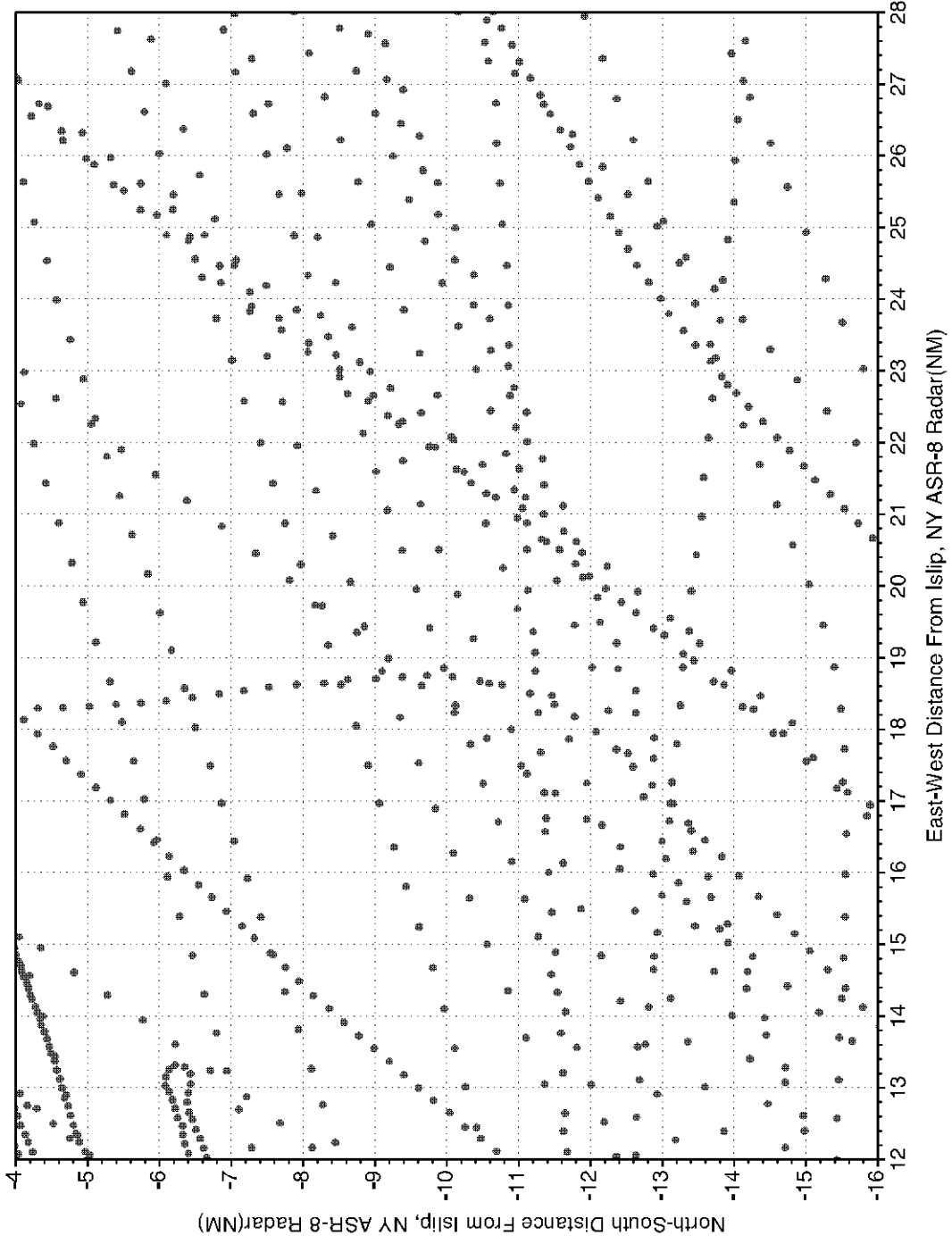
# ISLIP ASR-8 Radar Aug24 2230-2300(Z), 1999 RT and BT

BT  
+ RT



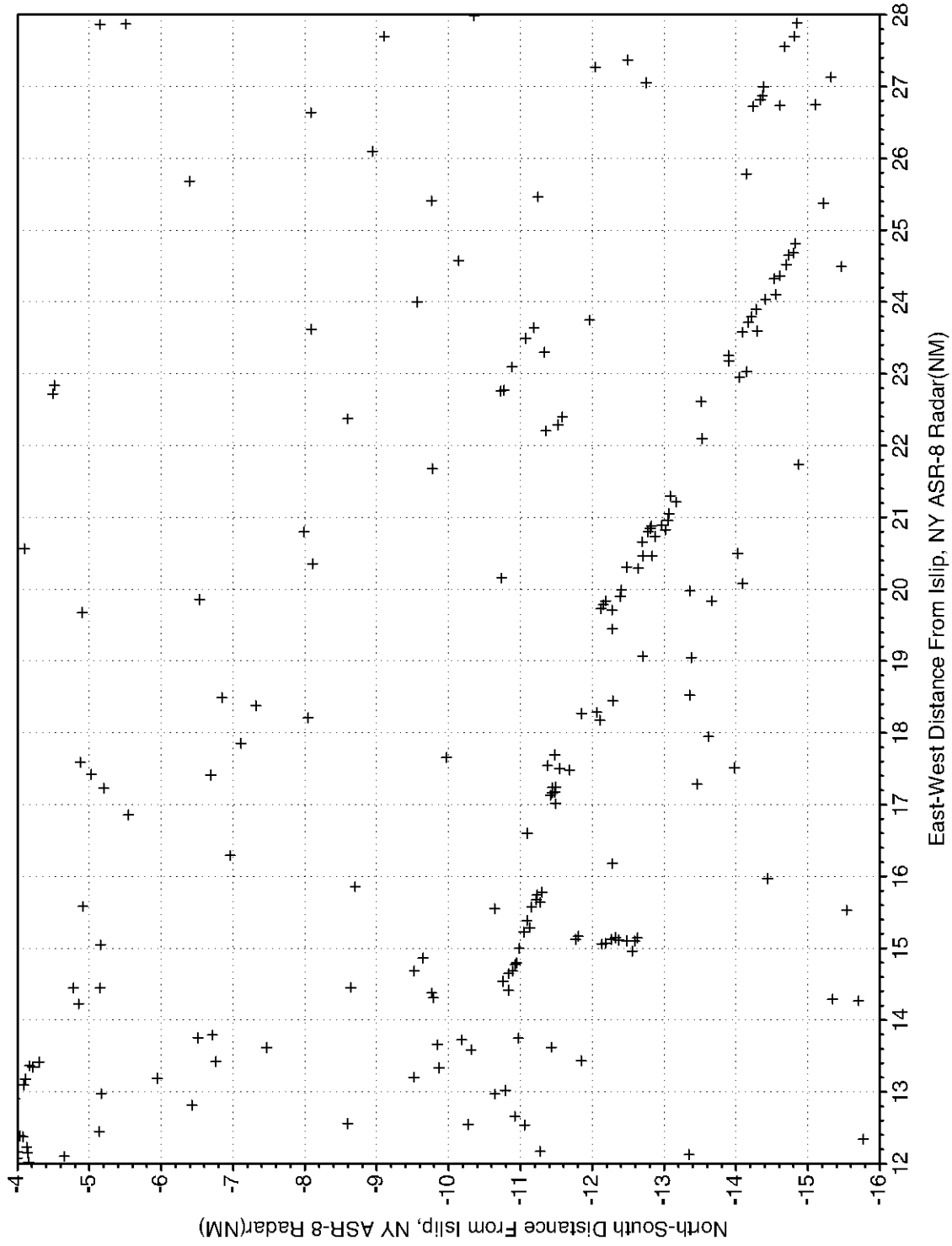
ISLIP ASR-8 Radar Aug24 2300-2330(Z), 1999 BT

BT



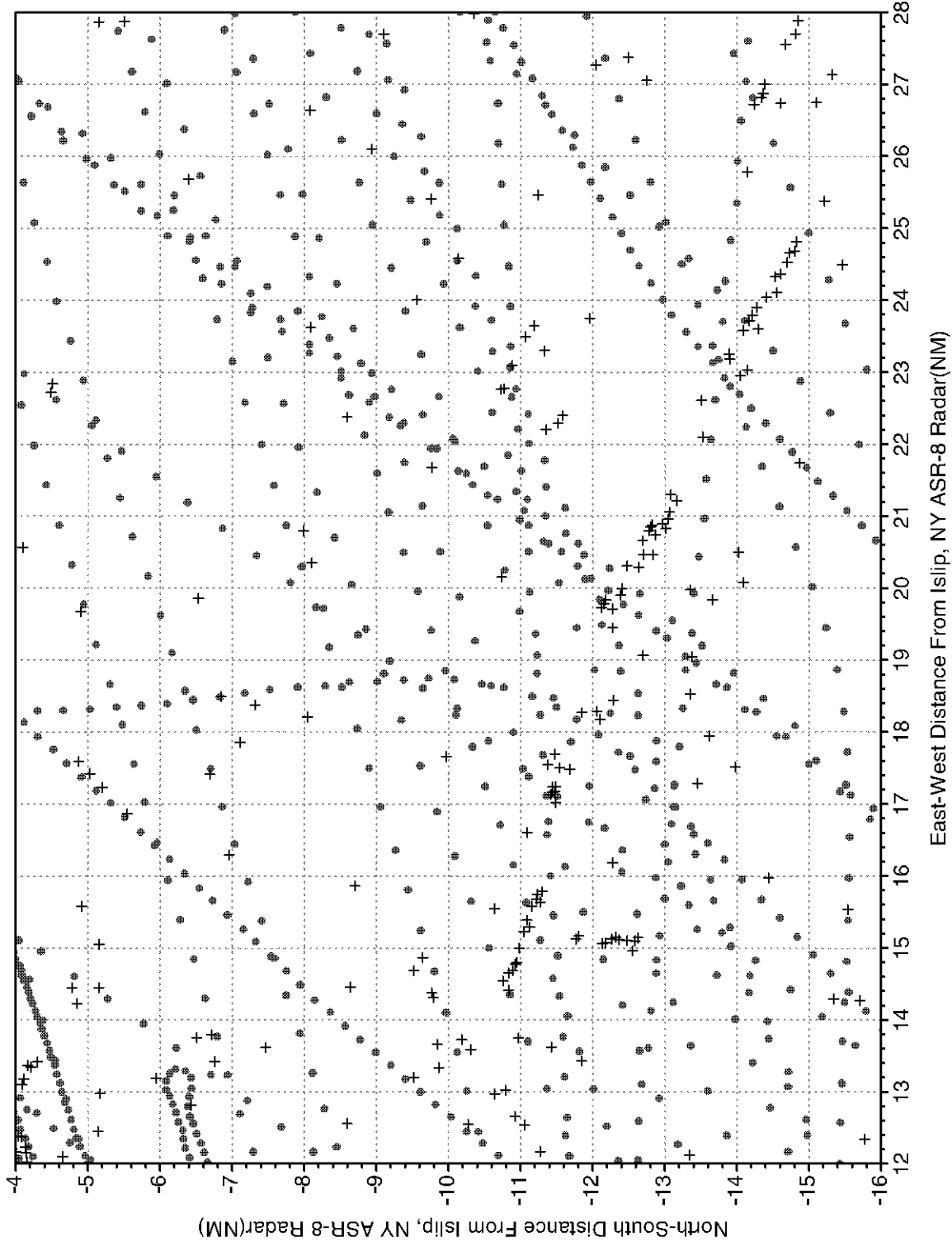
ISLIP ASR-8 Radar Aug24 2300-2330(Z), 1999 RT

+ RT



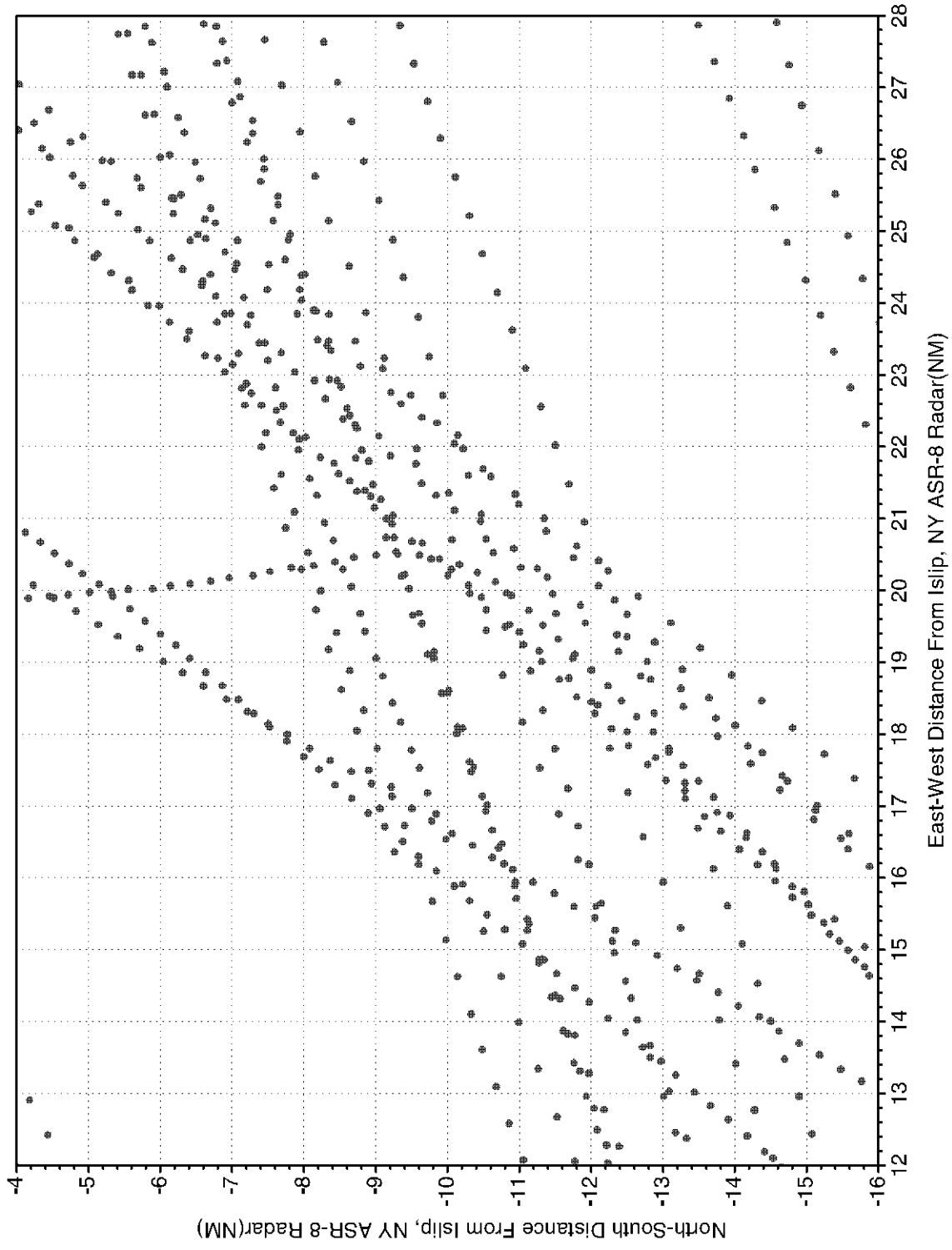
# ISLIP ASR-8 Radar Aug24 2300-2330(Z), 1999 RT and BT

● BT  
+ RT



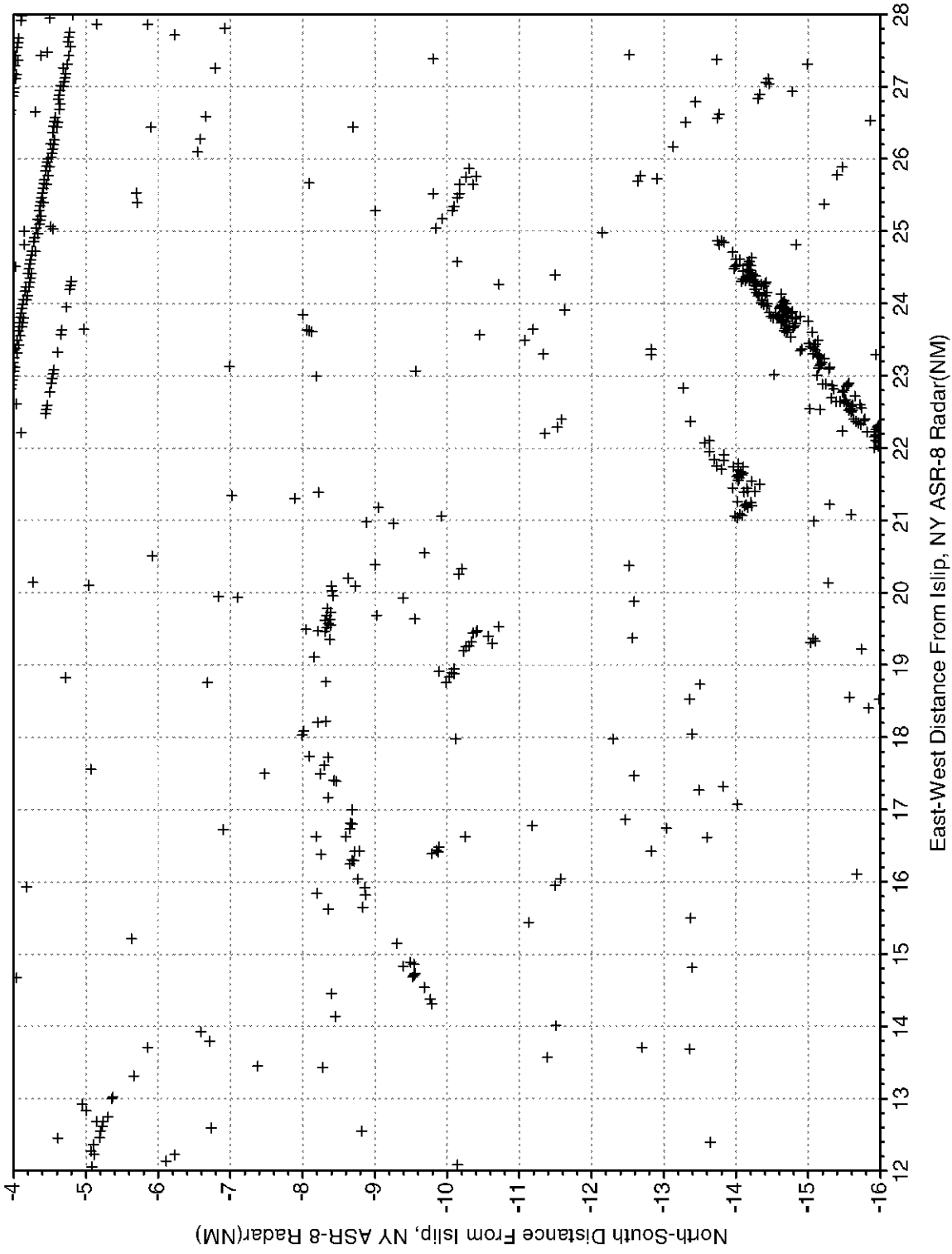
ISLIP ASR-8 Radar Aug24 2330-0000(Z), 1999 BT

BT



ISLIP ASR-8 Radar Aug24 2330-0000(Z), 1999 RT

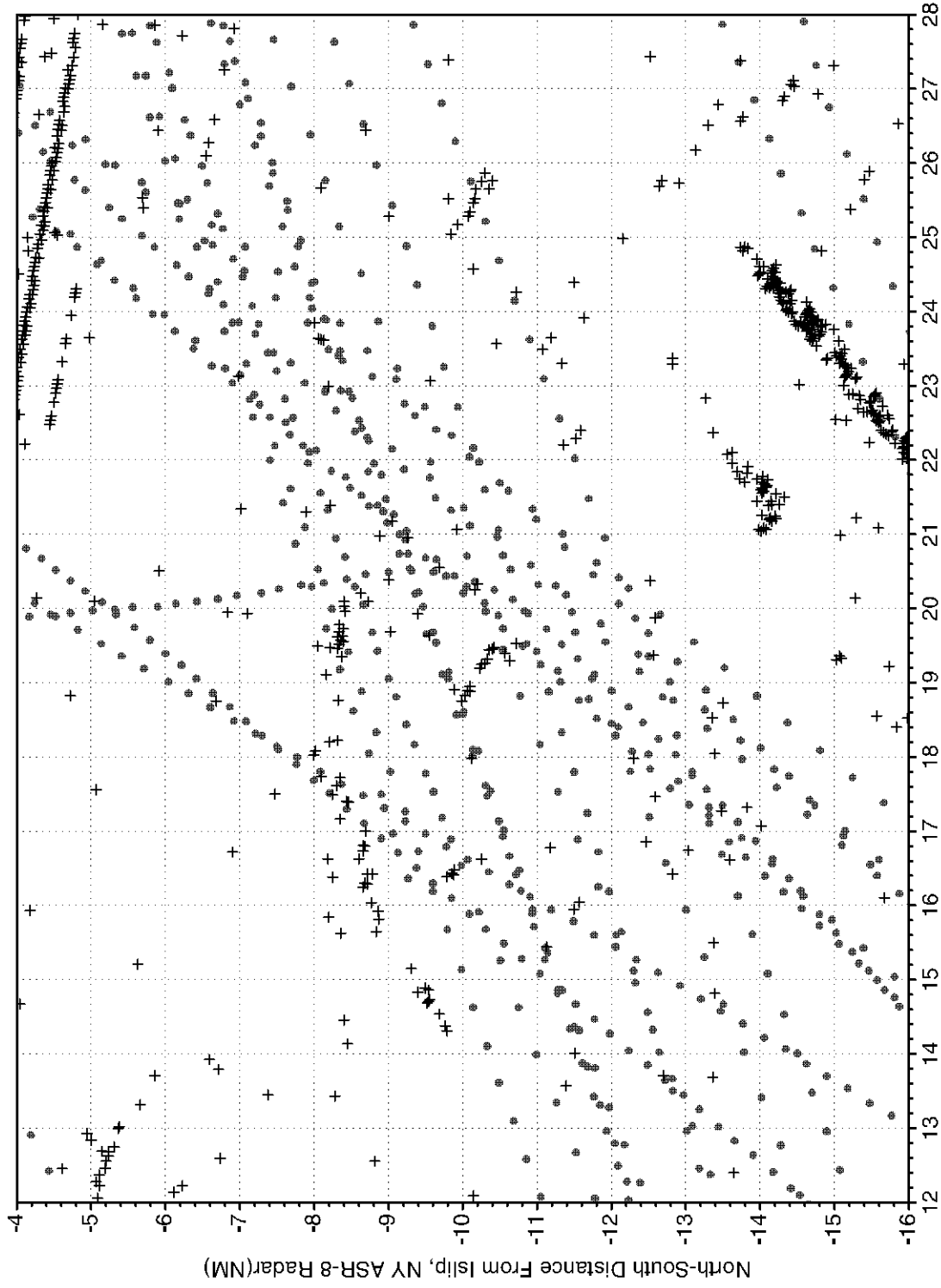
+ RT





# ISLIP ASR-8 Radar Aug24 2330-0000(Z), 1999 RT and BT

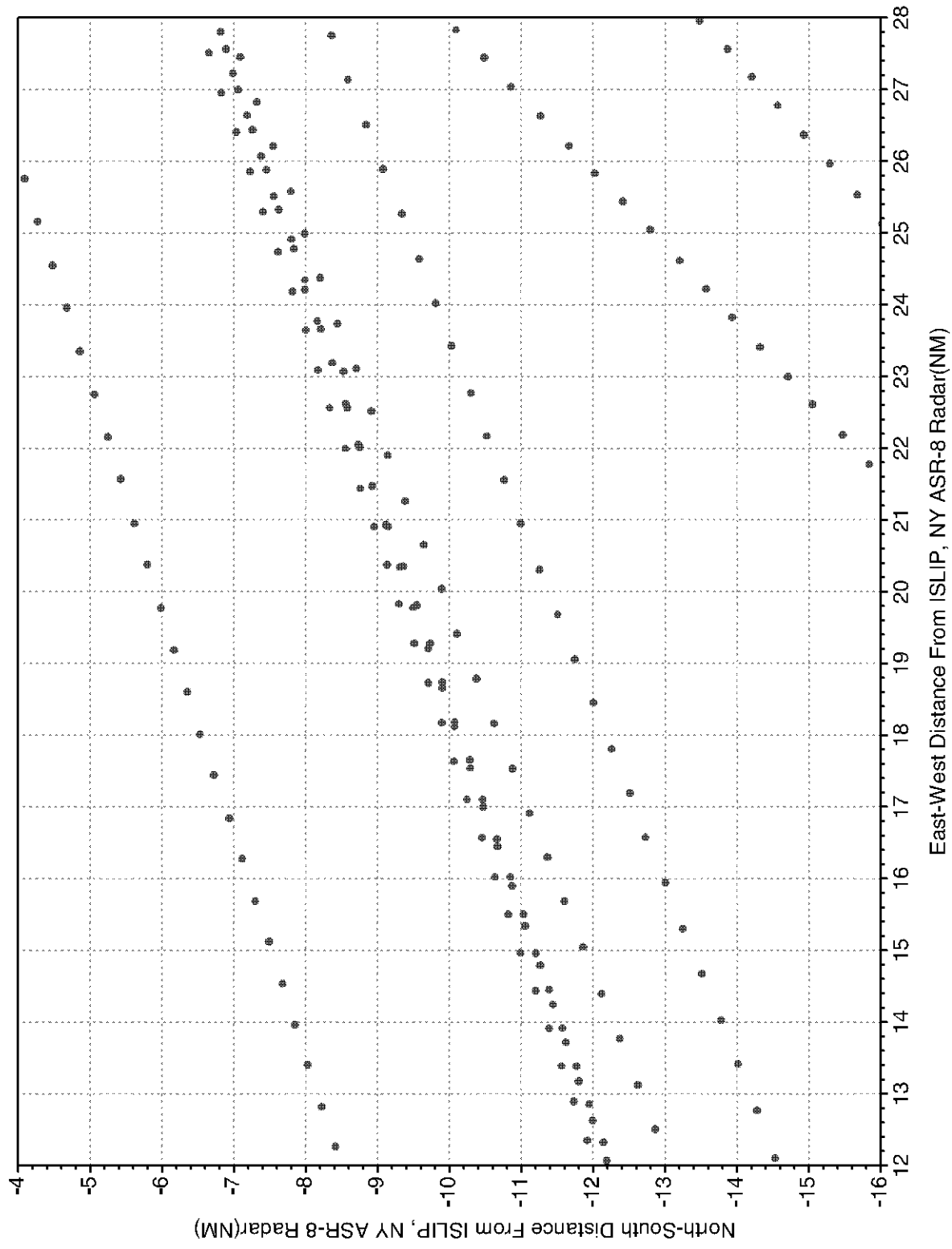
● BT  
+ RT



East-West Distance From Islip, NY ASR-8 Radar(NM)

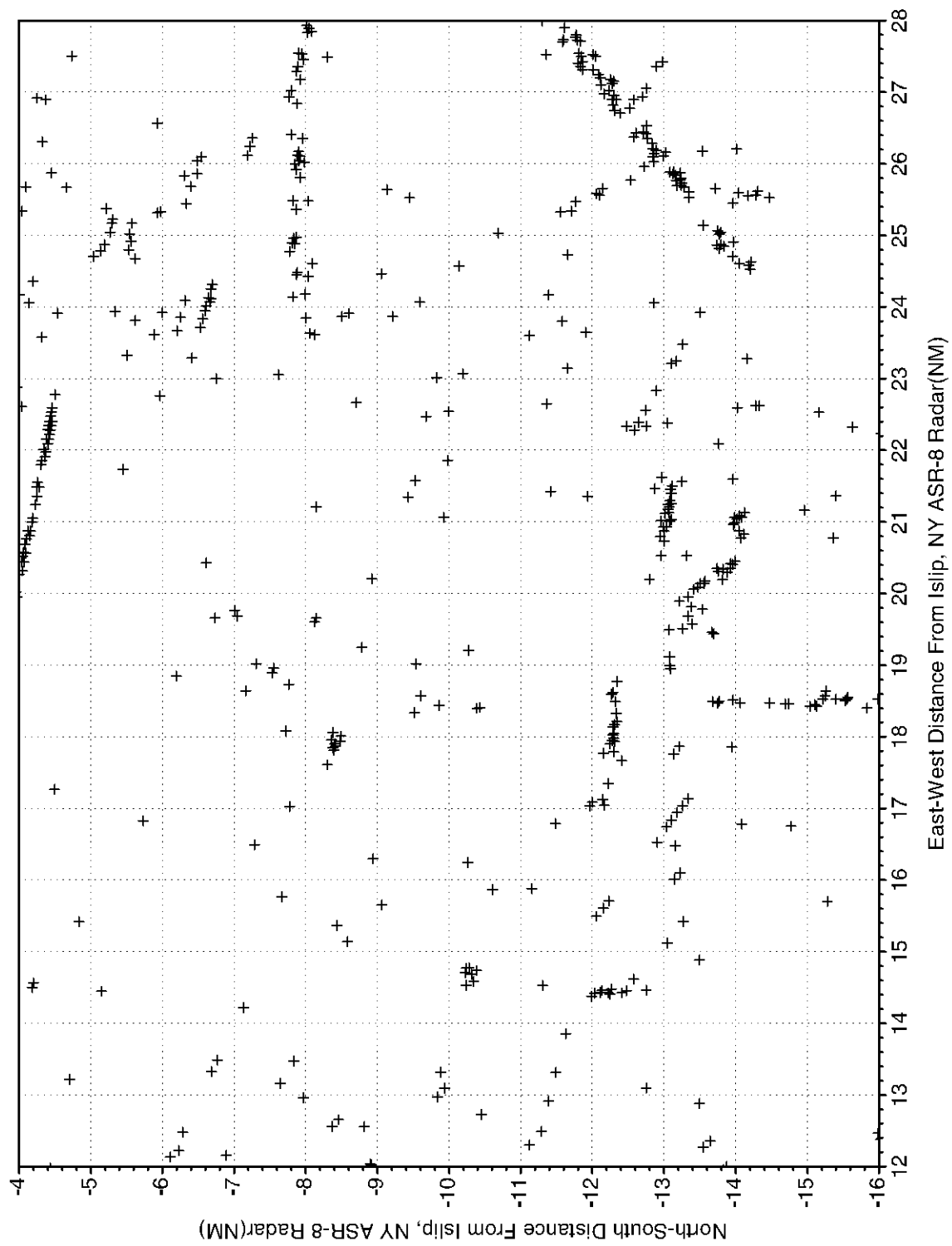
# ISLIP ASR-8 Radar Aug25 0000-0030(Z), 1999 BT

BT

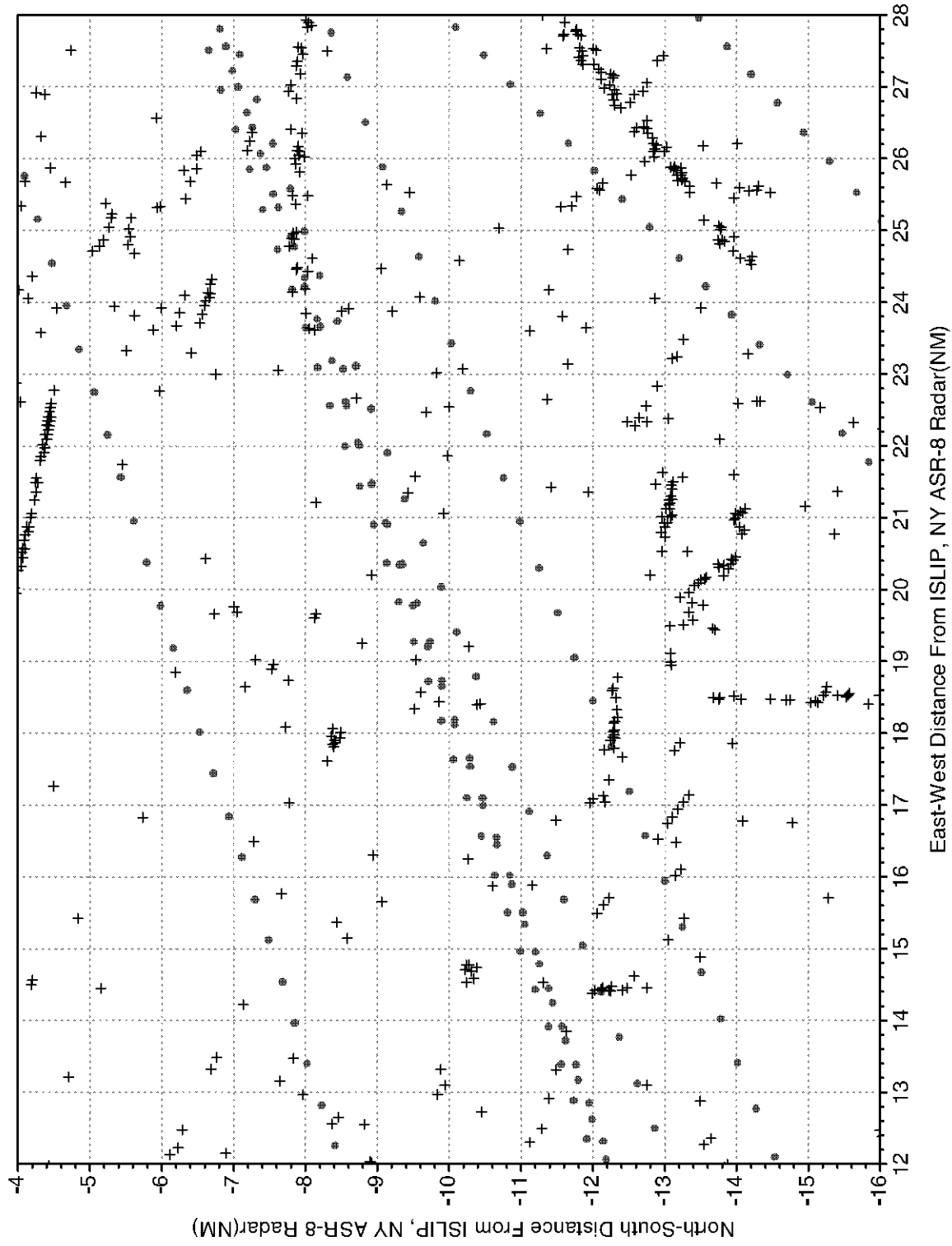
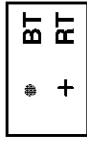


# ISLIP ASR-8 Radar Aug25 0000-0030(Z), 1999 RT

+ RT

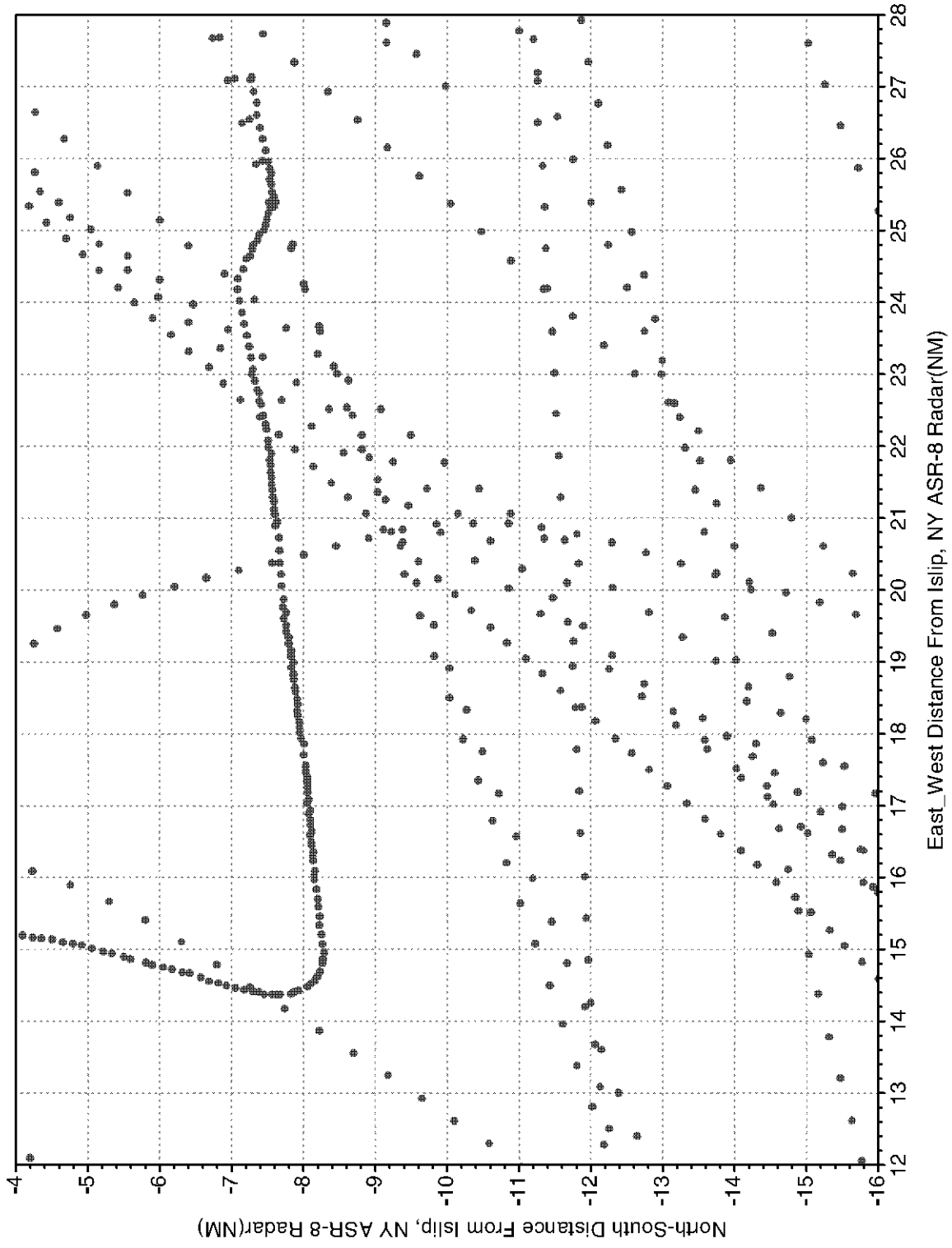


# ISLIP ASR-8 Radar Aug25 0000-0030(Z), 1999 RT and BT



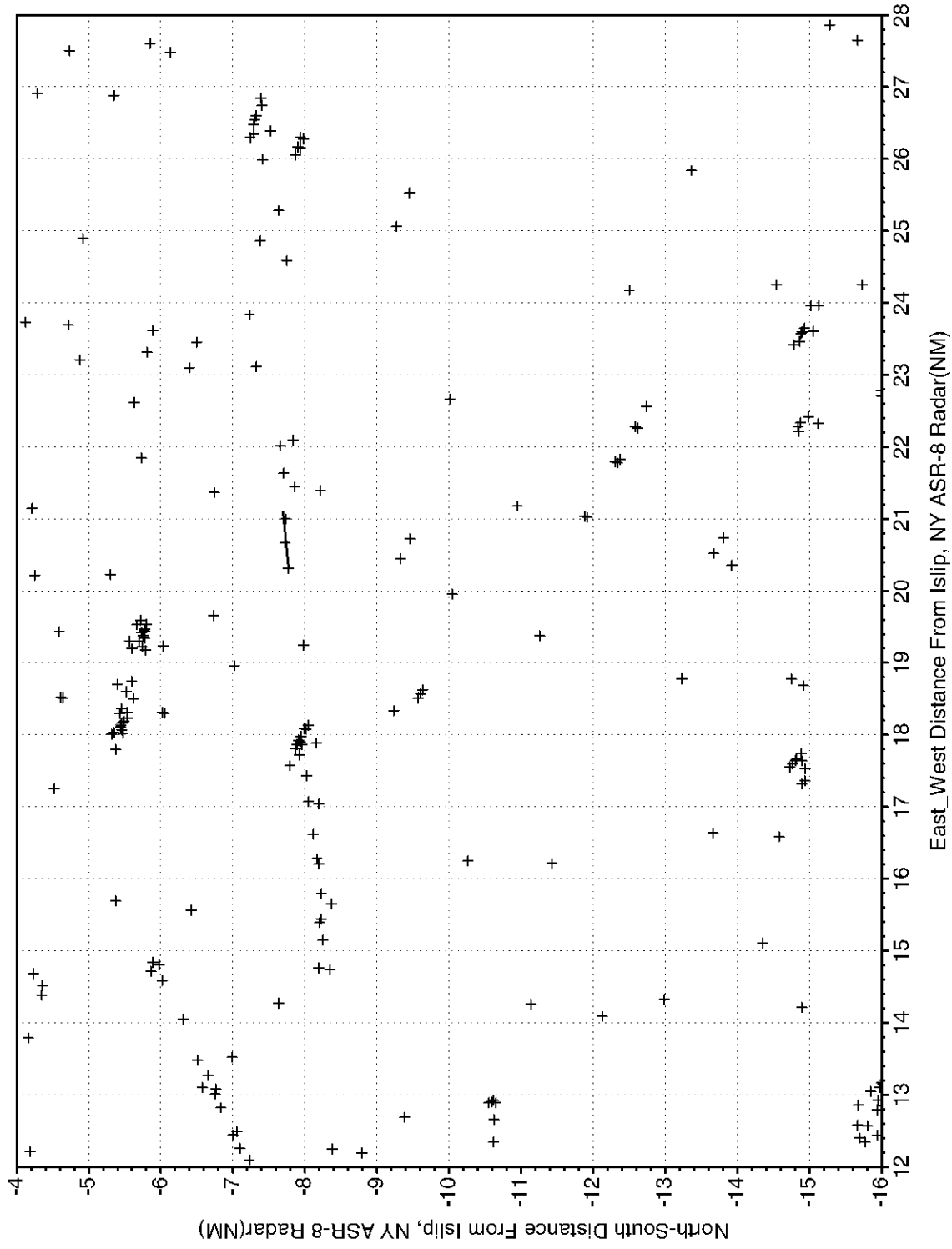
# ISLIP ASR-8 Radar Aug25 0030-0050(Z), 1999 BT

BT



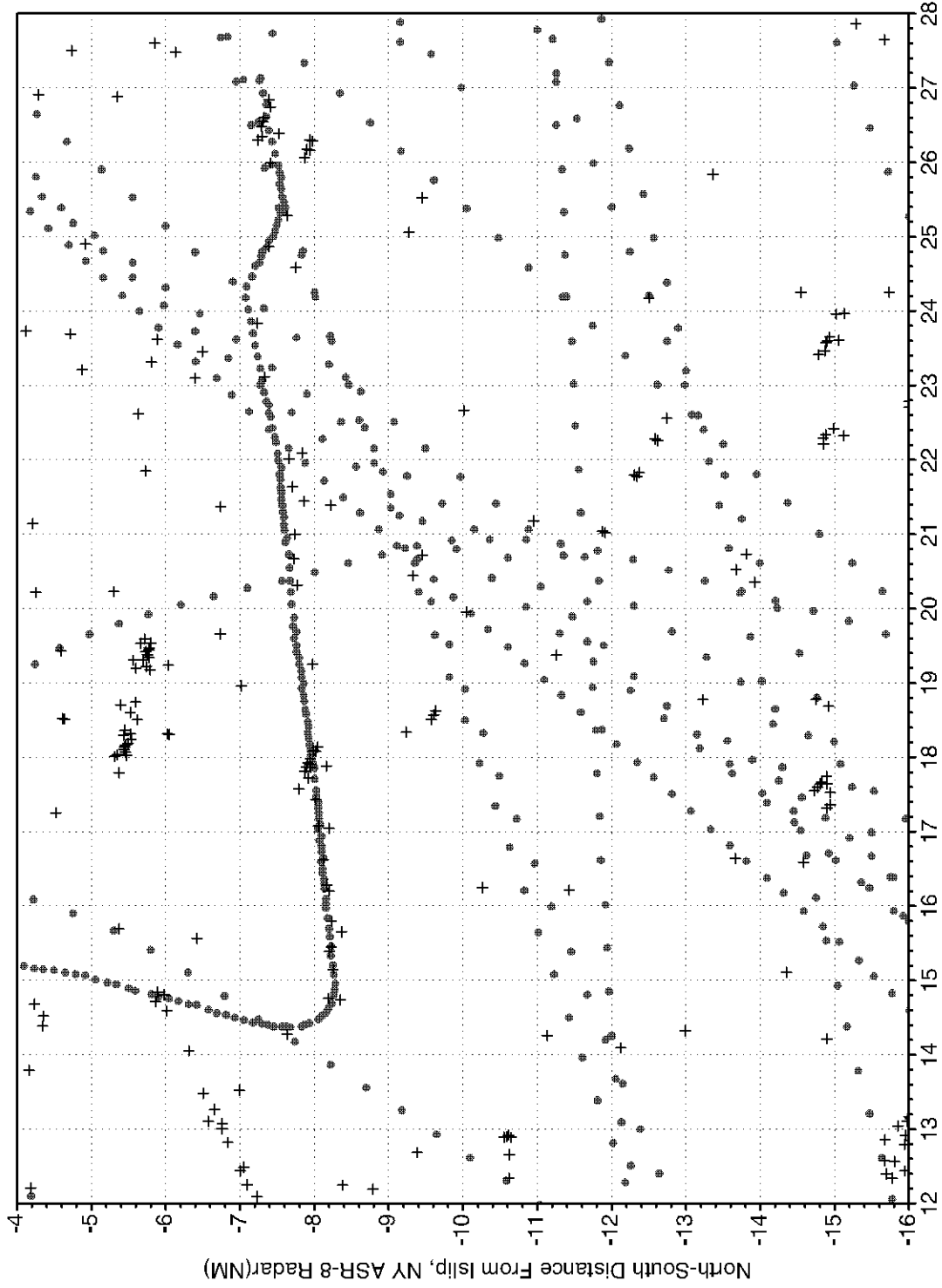
ISLIP ASR-8 Radar Aug25 0030-0050(Z), 1999 RT

+ RT



# ISLIP ASR-8 Radar Aug25 0030-0050(Z), 1999 RT and BT

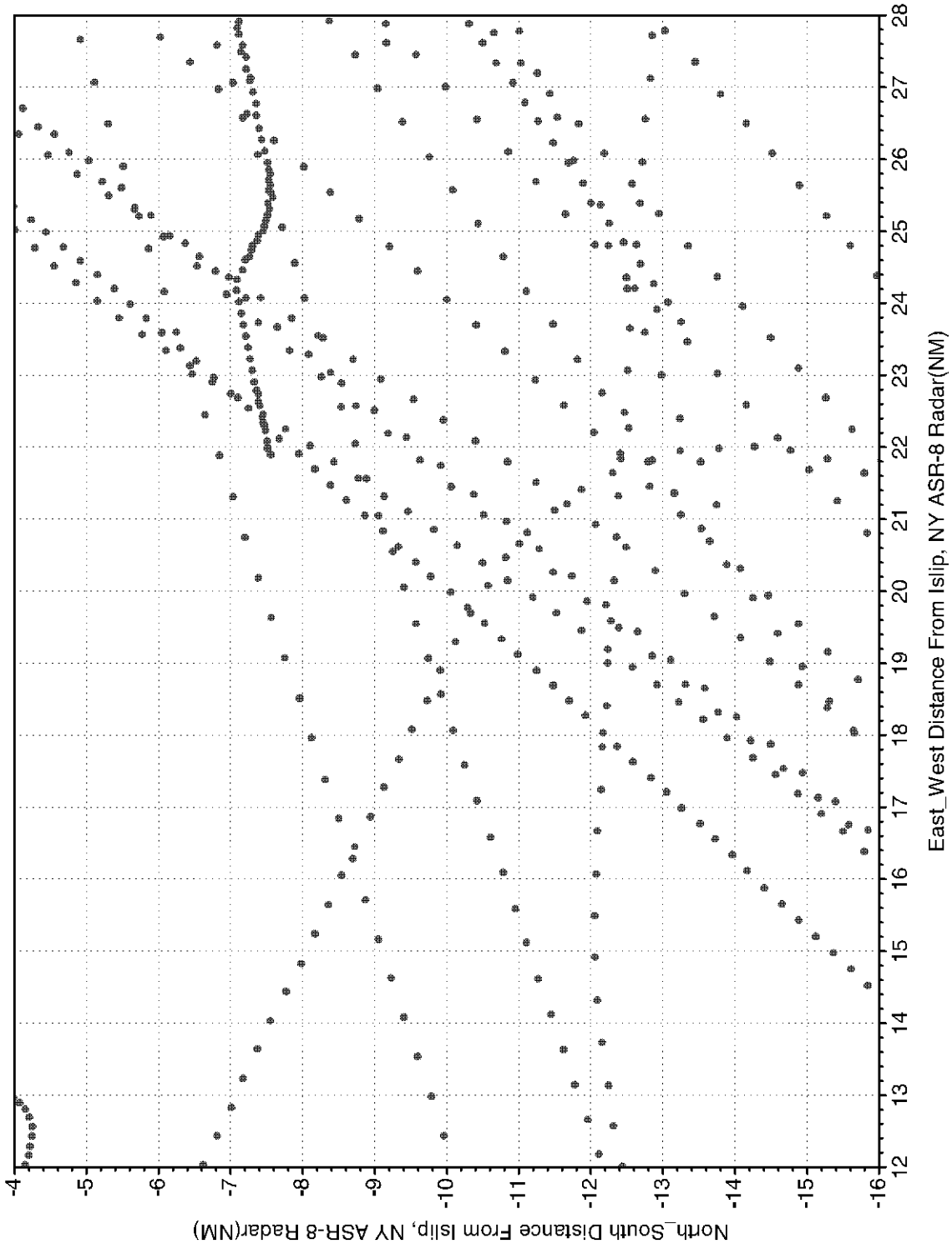
BT  
RT



East\_West Distance From Islip, NY ASR-8 Radar(NM)

ISLIP ASR-8 Radar Aug25 0050-0116(Z), 1999 BT

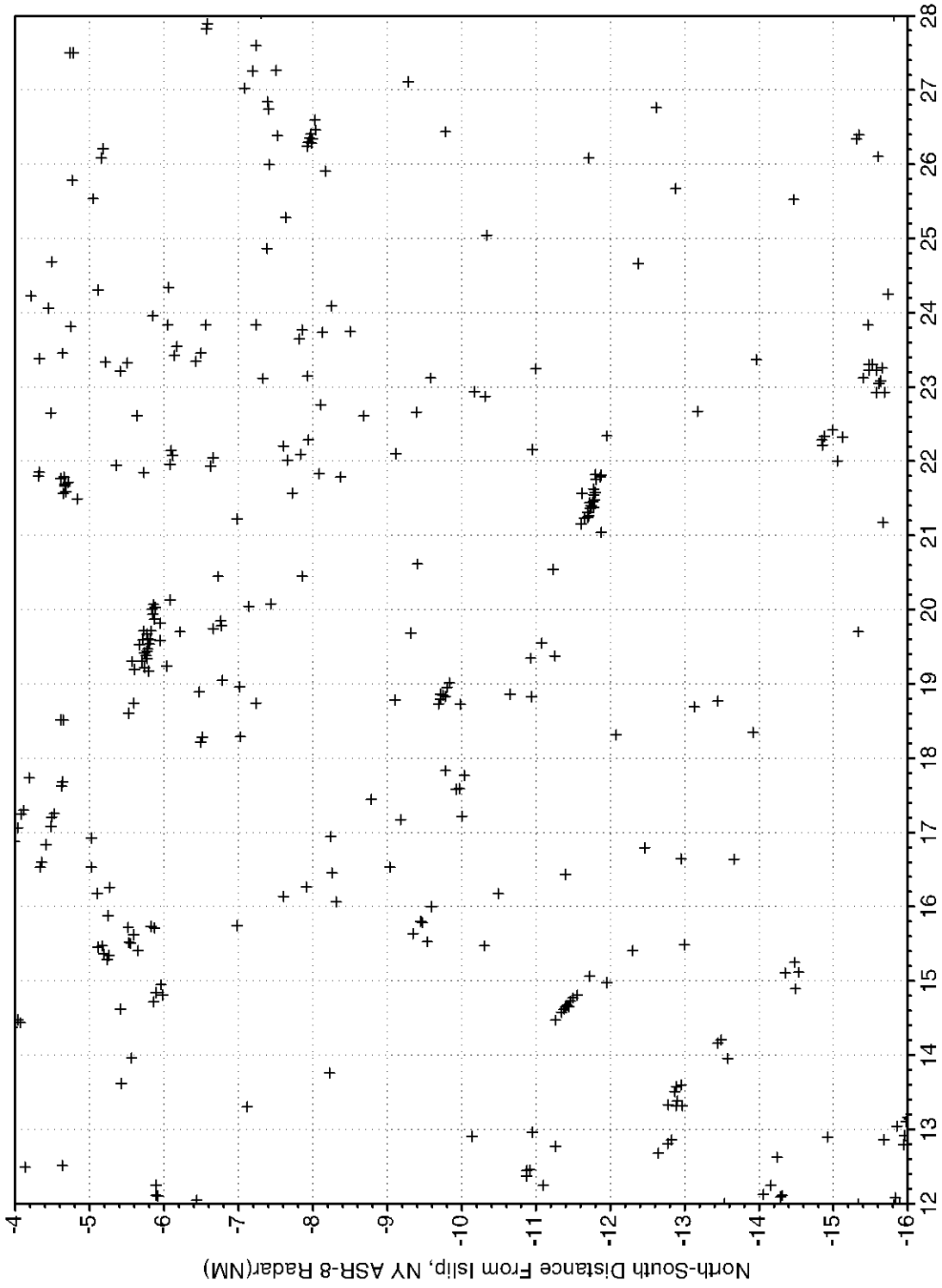
BT





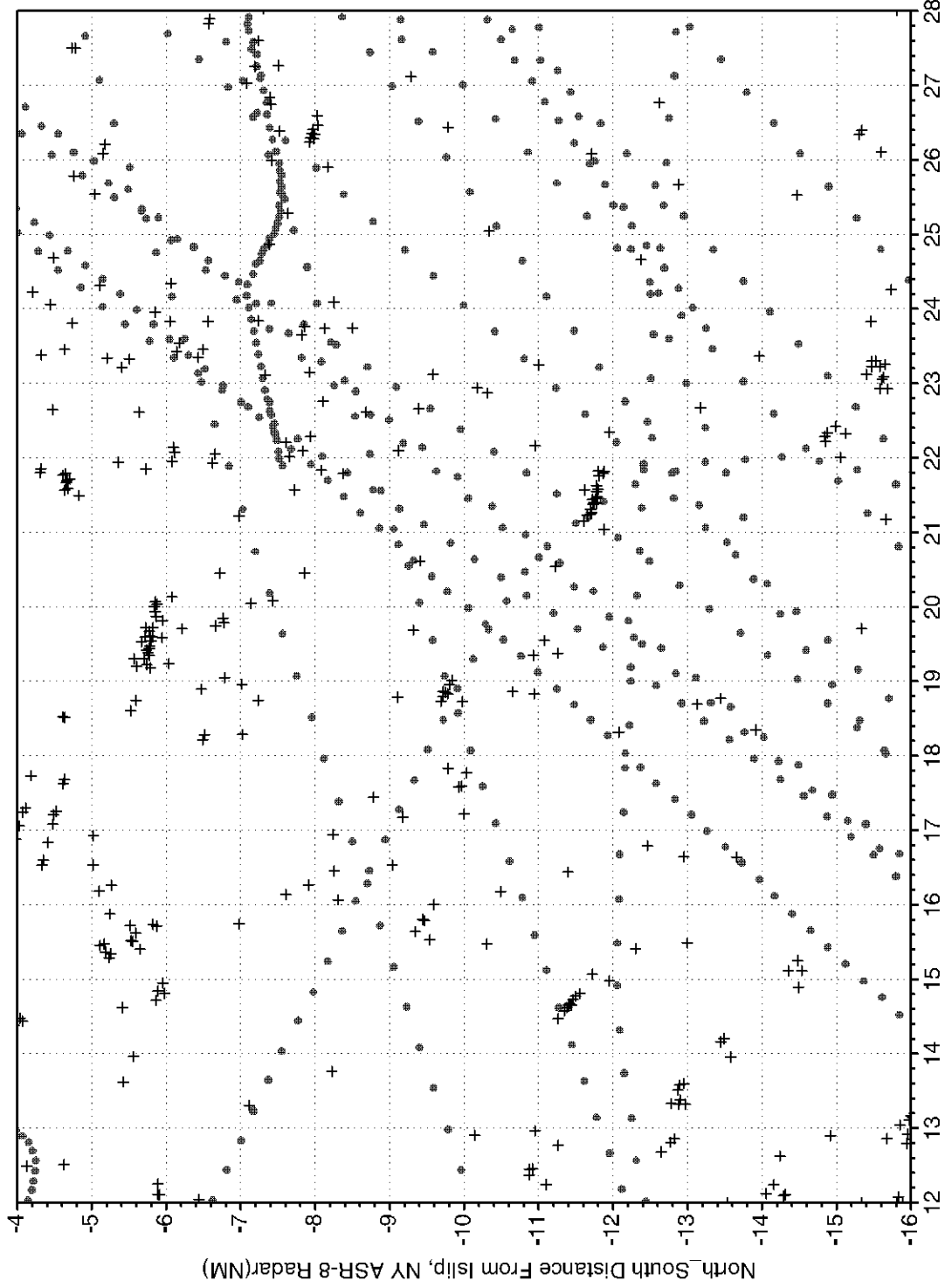
ISLIP ASR-8 Radar Aug25 0050-0116(Z), 1999 RT

+ RT



# ISLIP ASR-8 Radar Aug25 0050-0116(Z), 1999 RT and BT

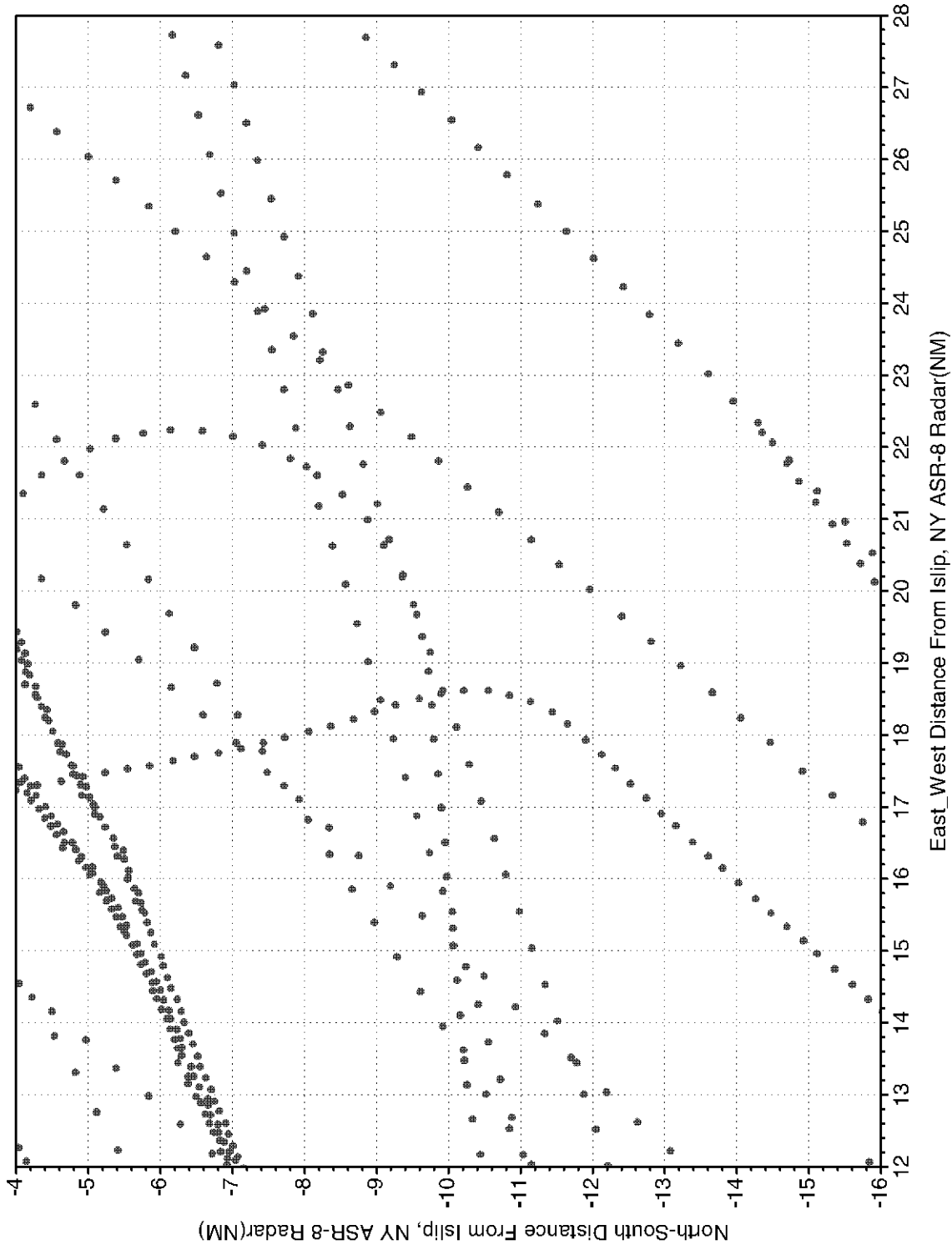
● BT  
+ RT



East\_West Distance From Islip, NY ASR-8 Radar(NM)

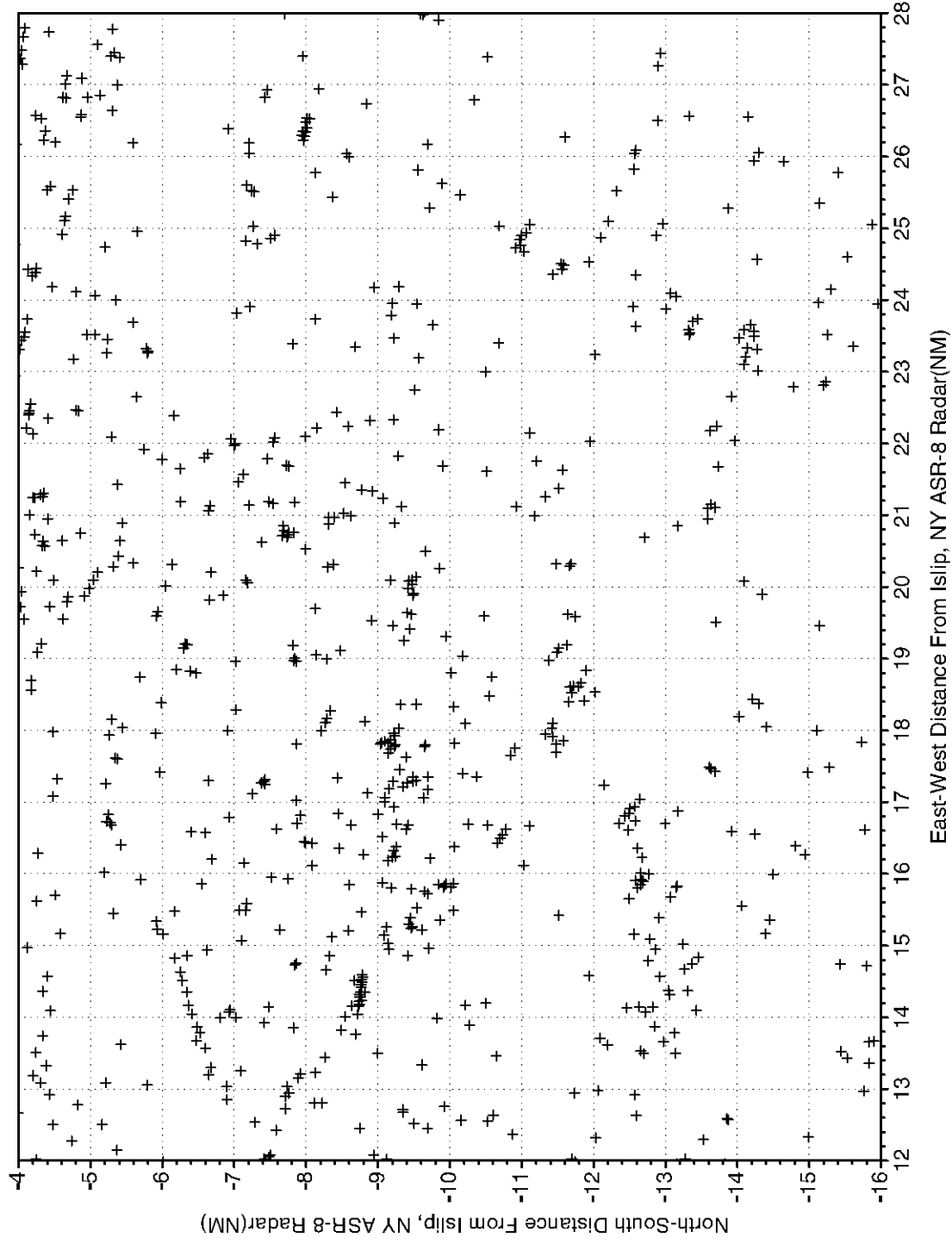
ISLIP ASR-8 Radar Aug25 0116-0200(Z), 1999 BT

BT



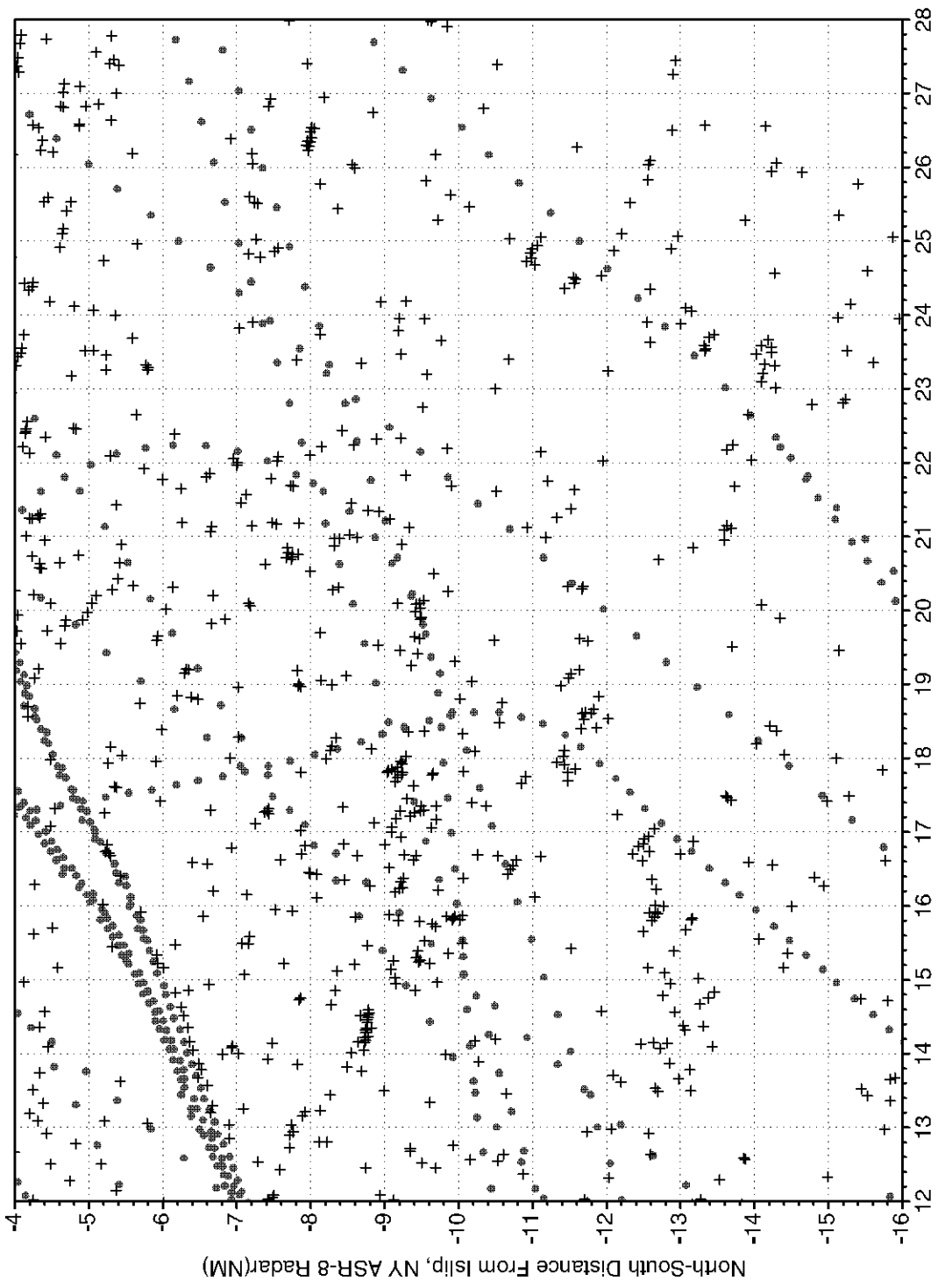
ISLIP ASR-8 Radar Aug25 0116-0200(Z), 1999 RT

+ RT



# ISLIP ASR-8 Radar Aug25 0116-0200(Z), 1999 RT and BT

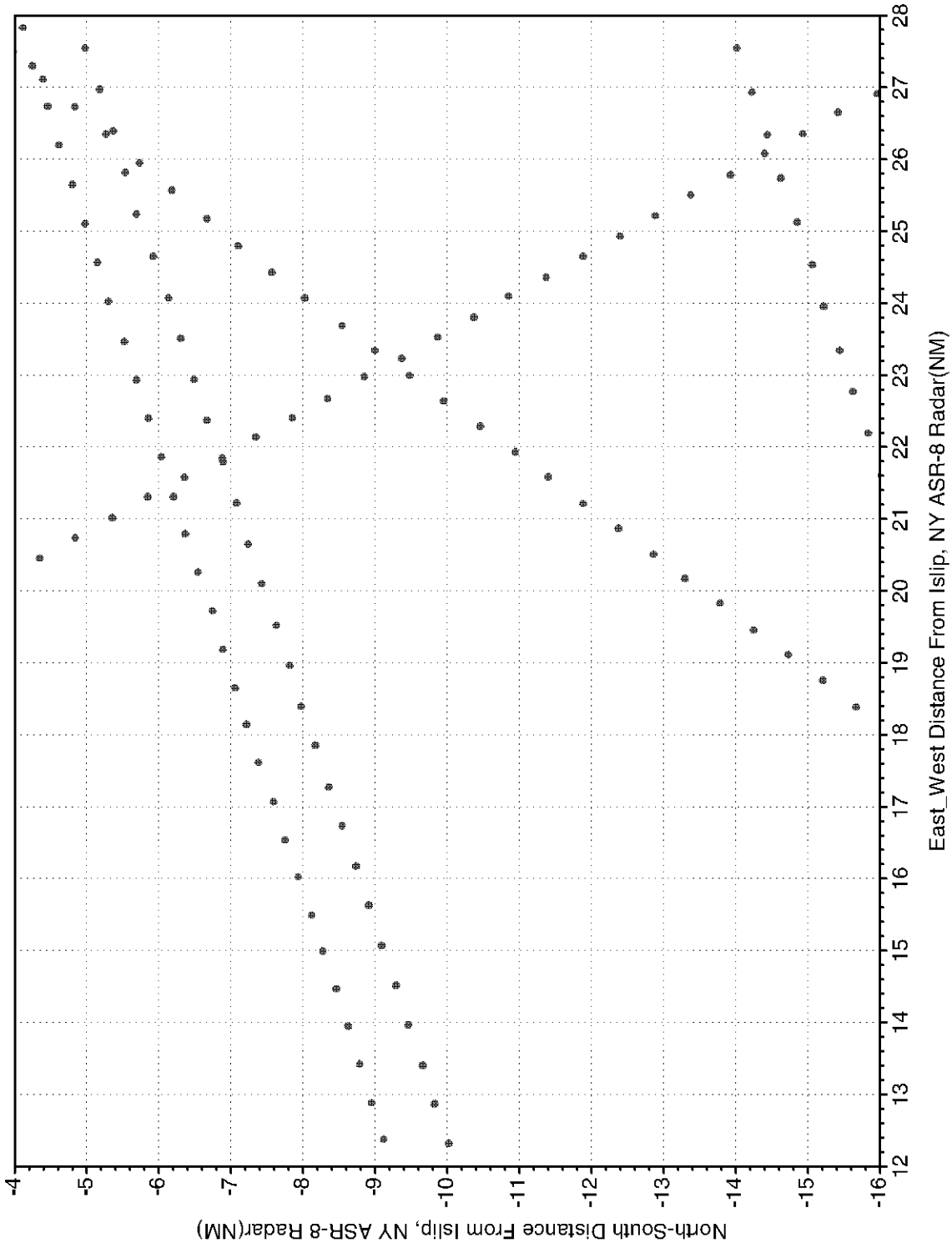
● BT  
+ RT



East\_West Distance From Islip, NY ASR-8 Radar(NM)

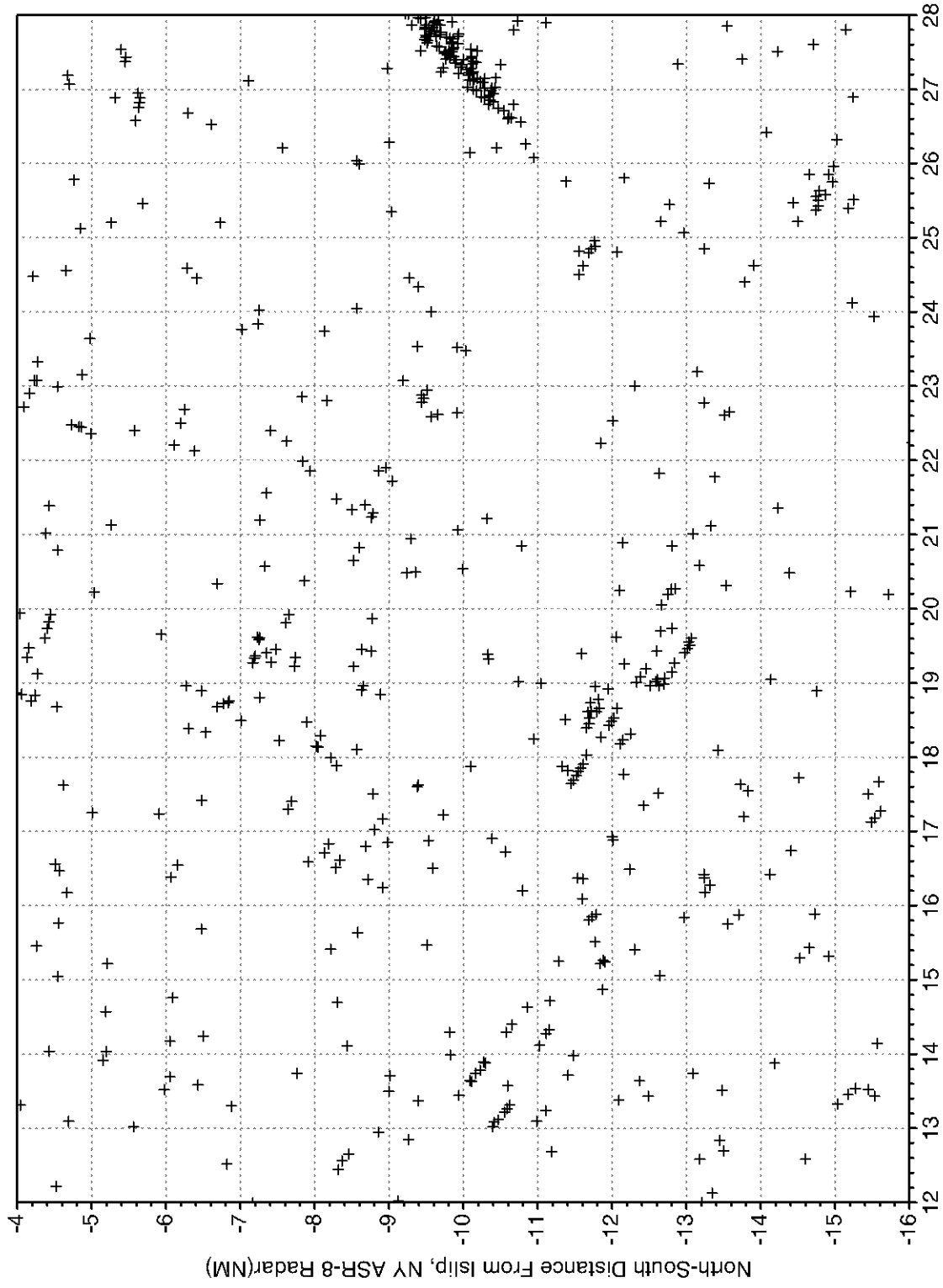
ISLIP ASR-8 Radar Aug25 0200-0230(Z), 1999 BT

BT



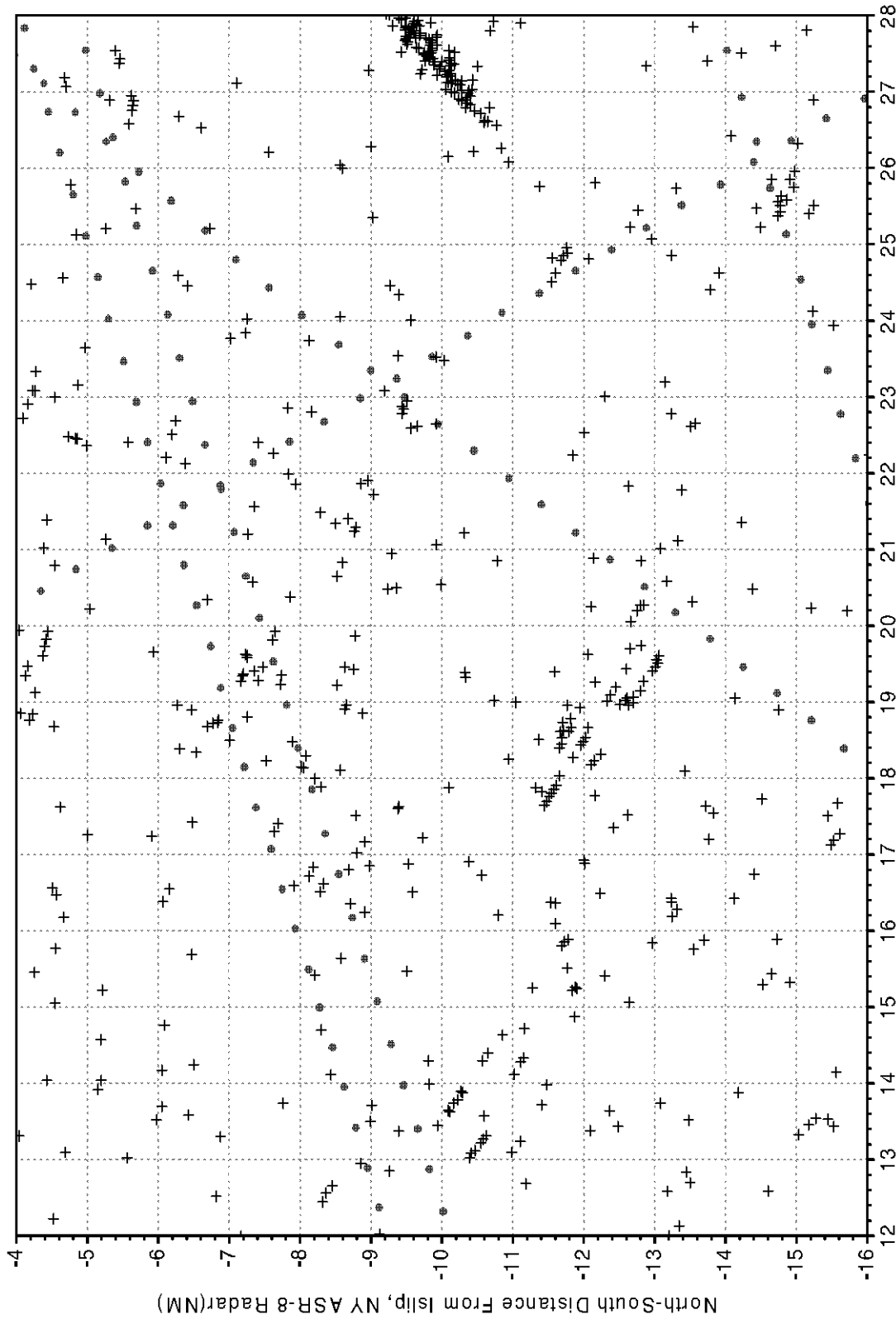
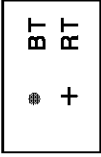
# ISLIP ASR-8 Radar Aug25 0200-0230(Z), 1999 RT

+ RT



East-West Distance From Islip, NY ASR-8 Radar(NM)

# ISLIP ASR-8 Radar Aug25 0200-0230(Z), 1999 RT and BT



East\_West Distance From Islip, NY ASR-8 Radar(NM)