

Site Selection and Construction

Youngang Wang

2015-09-07

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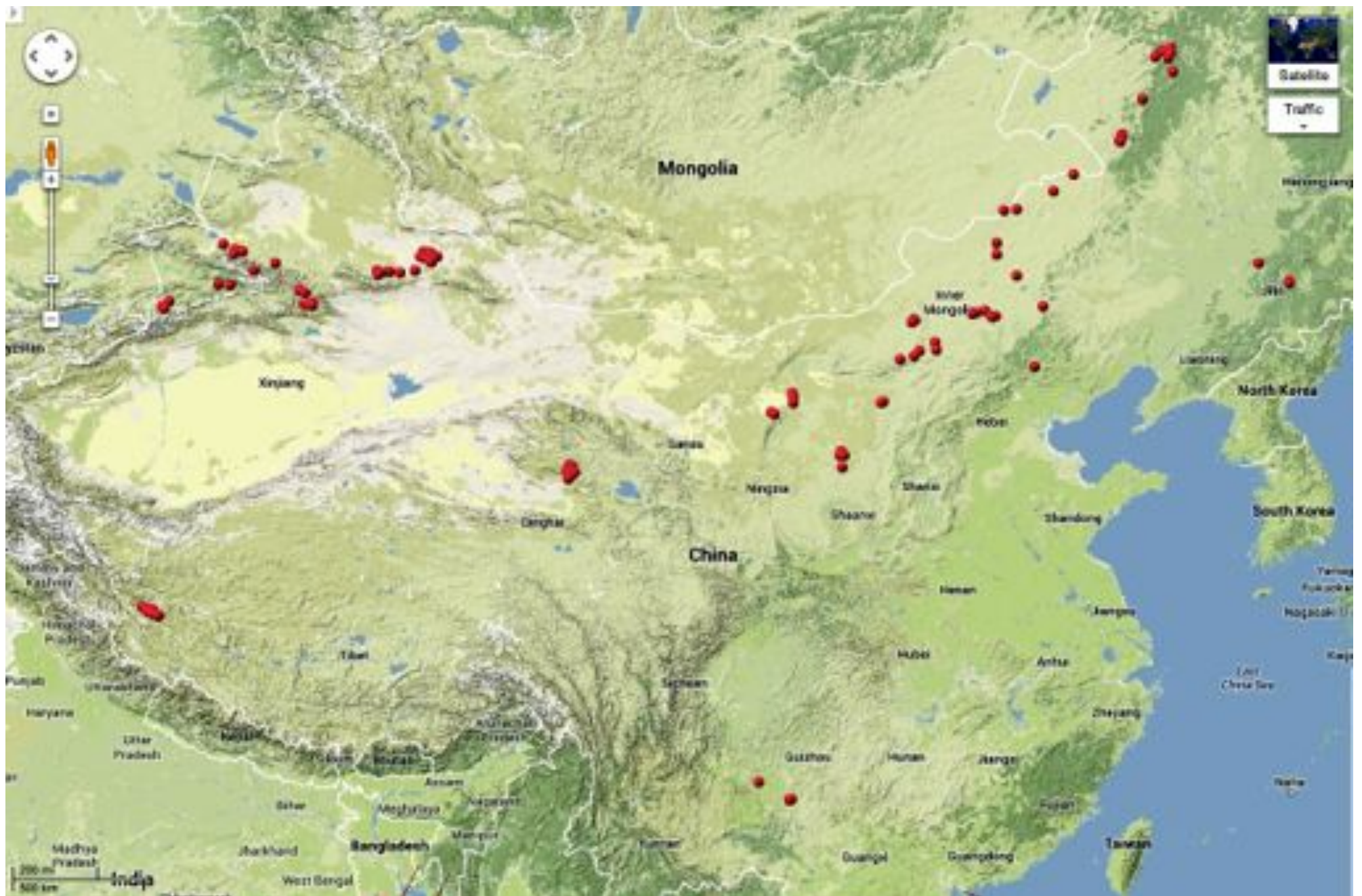
Outline

- Site selection
- Electromagnetic environment of Hong Liu Xia site
- Site construction

Selected conditions

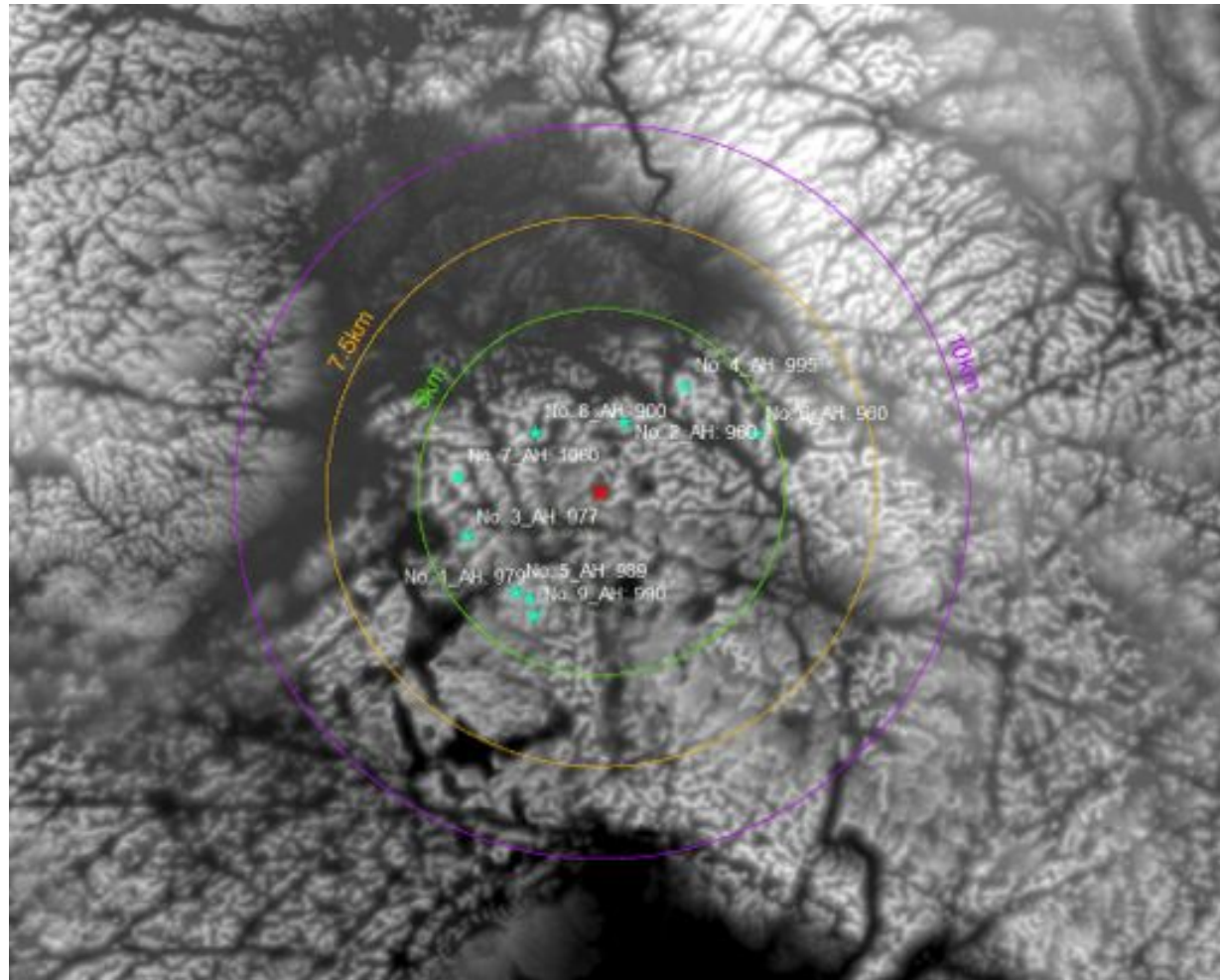
Subjects	Requirements
1、Radio noise	Clean electromagnetic environment in the range 400MHz-1.5GHz;
2、Terrain	north-south (150 meters), east-west (150 meters butterfly-like depressions; Maskable terrain interference from the horizon;
3、Land use	Avoiding agricultural land and residential areas;
4、Traffic	Close to the road;
5、Electricity	within 10 kilometers ;
6、Weather conditions	Avoiding desert and edges, large outlet, extreme whether condition ;
7、Engineering geology	Avoid earthquake, stable geological environment
8、Water	Easy to dig the well.

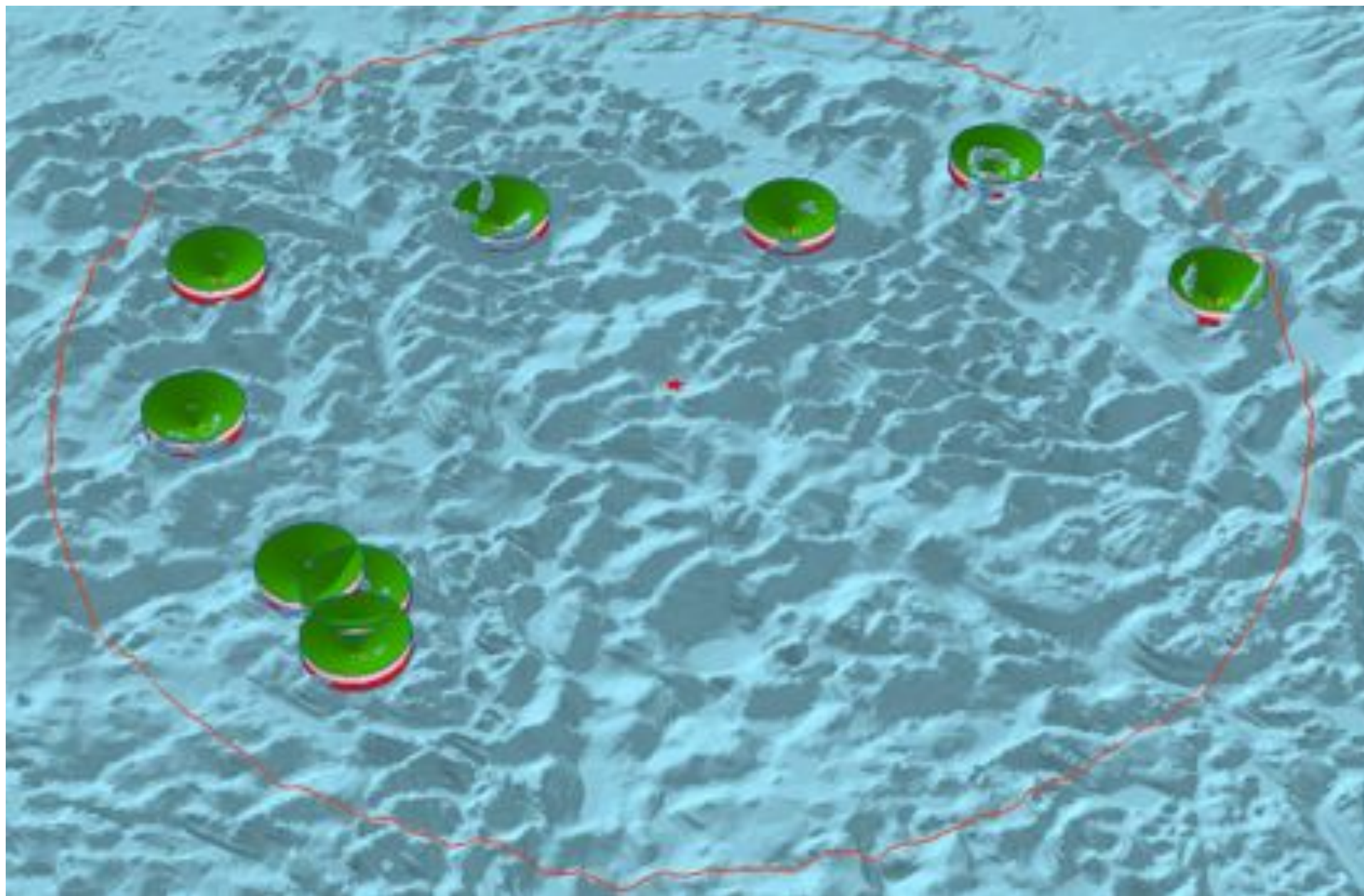
data	Position	number
2011.4.9-14	Guizhou (Da Wodang Puding)	14
2011.5.3-6	Inner Mongolia (Bai qi), Hebei	7
2011.5.27-6.3	Xinjiang (Da Shankou)	8
2011.11.2-4	Guizhou (Chang shun)	6
2012.6.29-7.2	Inner Mongolia (Da qing shan)	5
2012.9.1-9.15	Qinghai (De ling ha)	11
2012.9.19-23	Xingjiang(Qitai and Da Shankou)	2
2013.7.20-7.25	Xinjiang (Heshuo)	3
2013.9.12-9.19	Xinjiang (Qitai, MuLei, Bali Kun)	11
2013.10.1-10.8	Xinjiang (YiLi)	10



Guizhou, Inner Mongolia, Xinjiang, Xizang, Qinghai, Hebei, Jilin et al.

Guizhou



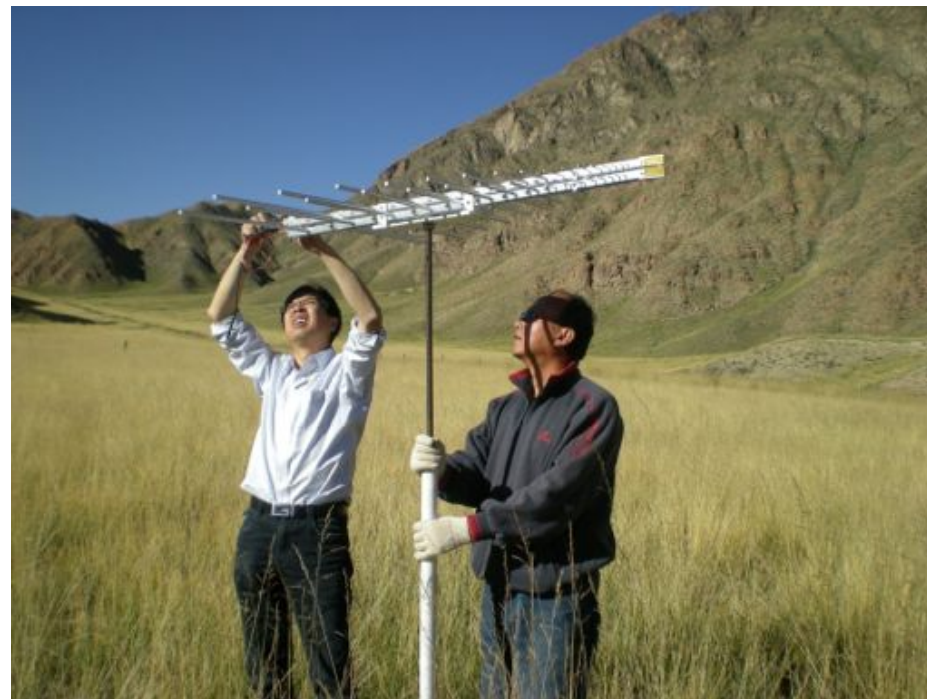




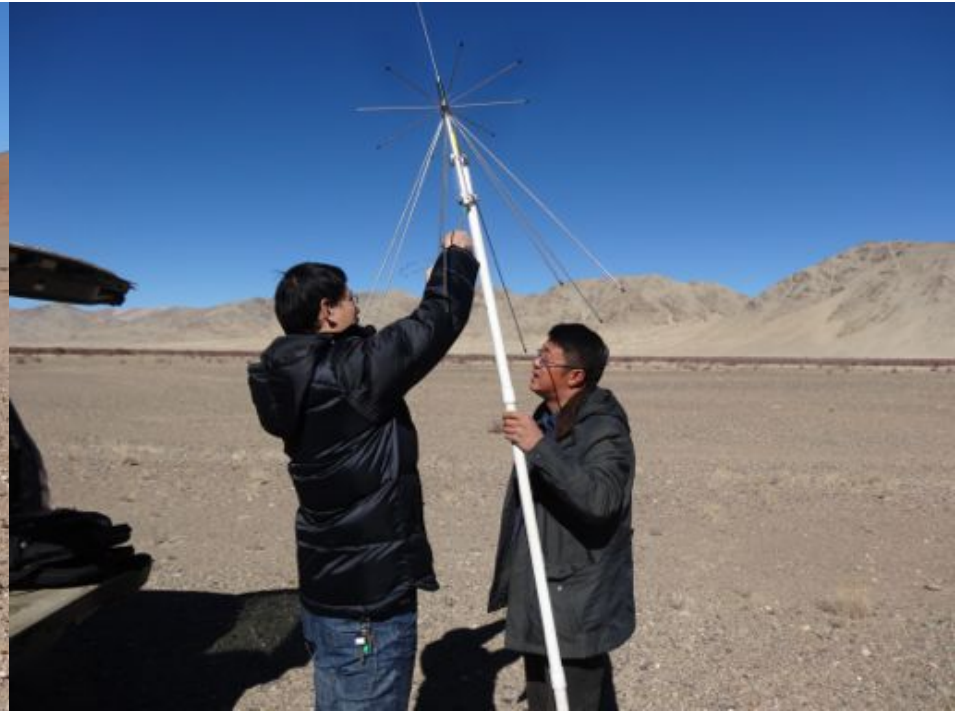
Inner Mongolia



Qinghai



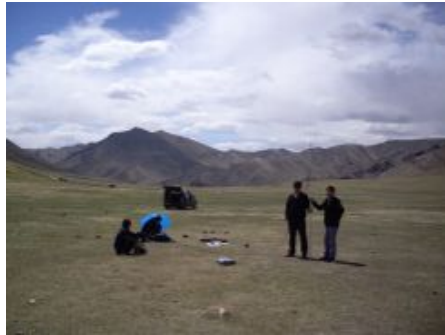
XiZang



Xinjiang



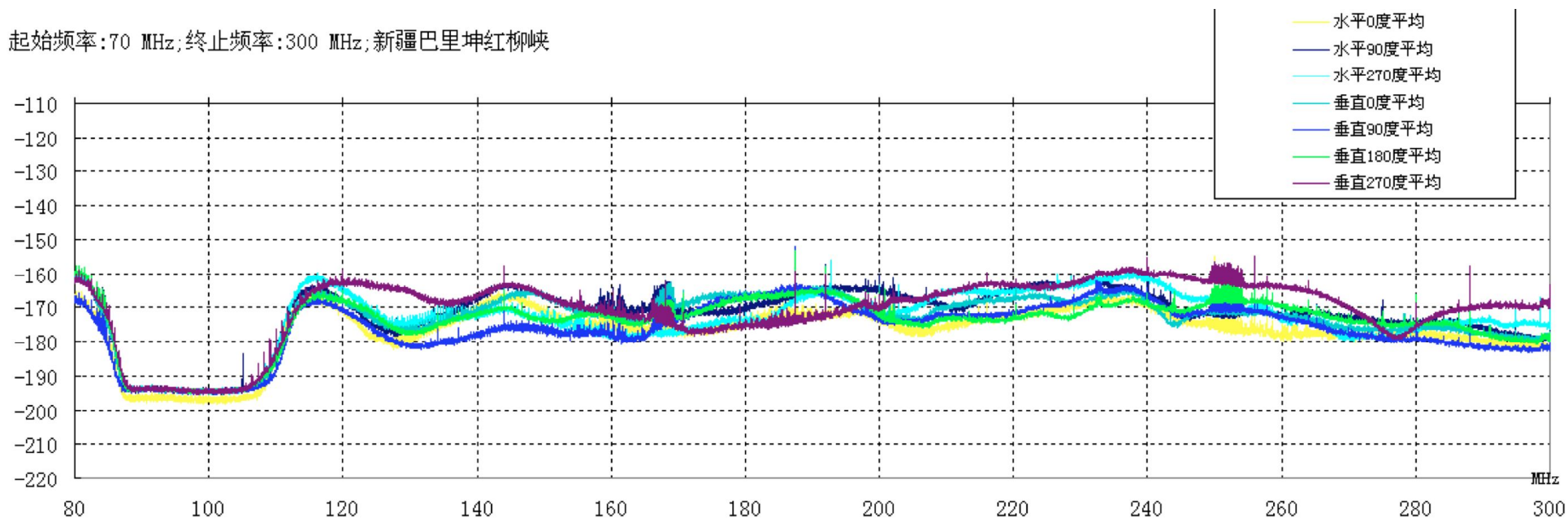




Electromagnetic environment of Hong Liu Xia site

- Time (2015.5.1-2015.5.3)
- People (Jianbin Li, Yougang Wang, Ying Ren)
- Antenna (Log-periodic, Double Ridge Horn)
Log-periodic: 300 MHz-1GHz, 7dbi
Double Ridge Horn: 1GHz-18Ghz, 10

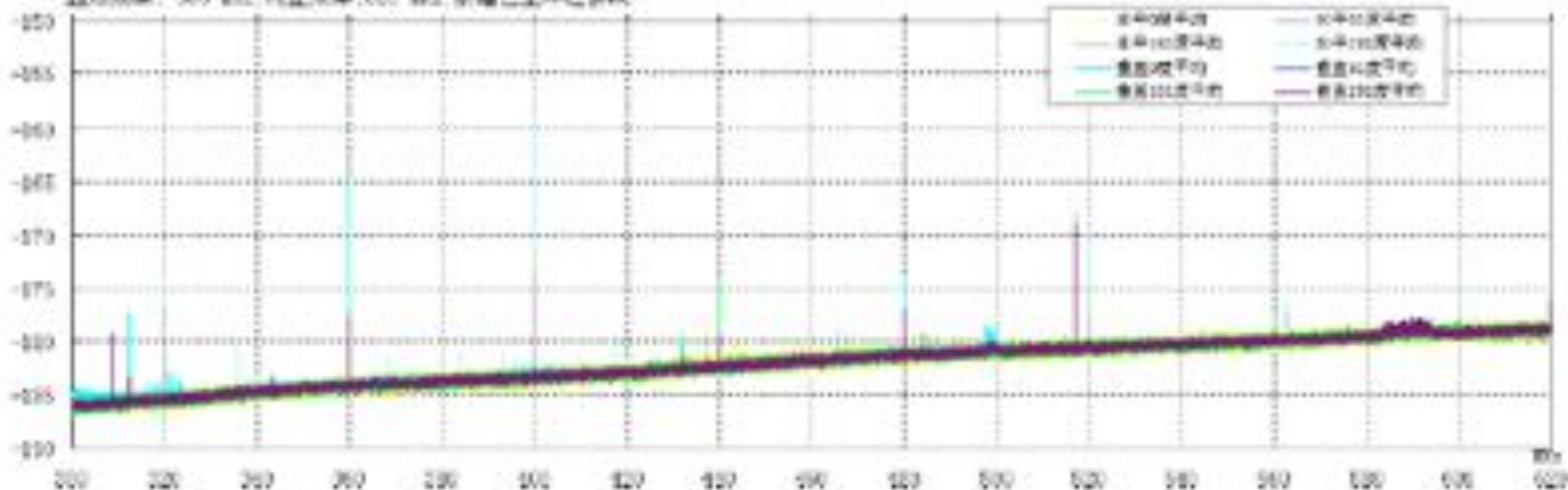
起始频率:70 MHz;终止频率:300 MHz;新疆巴里坤红柳峡



F(MHz)	Service\System	F(MHz)	Service\System
77.25-83.75	TV channel 4	150.05-153	RAS
87-108	FM	168-223	TV channel 6-12
108-138	Airplane communication	245-270	FLET SAT
137-138	METEOSAT		

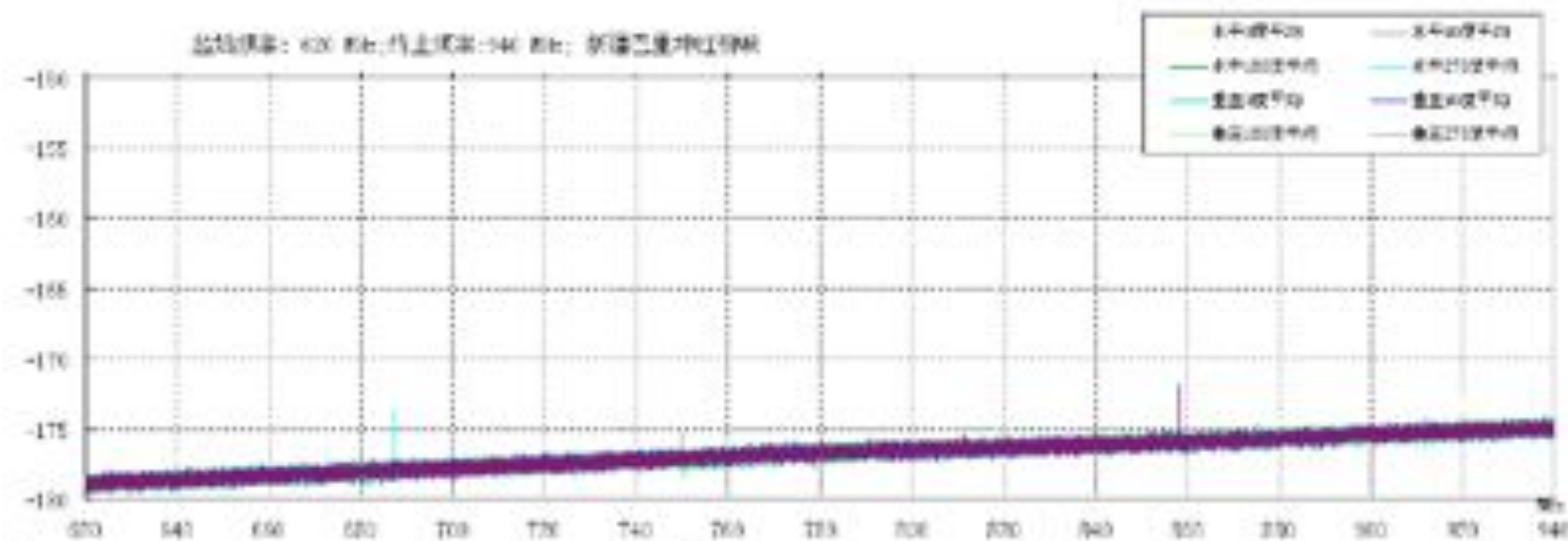
300-620MHz, 测试天线水平、垂直极化, 天线指向每隔90度4个方向测到的频谱图

起始频率: 300 MHz 终止频率: 620 MHz 频谱已重归一化



F(MHz)	Service/System	F(MHz)	Service/System
322-328.6	RAS	470-862	TV channel 13-56
406.1-410	RAS	606-610	RAS
410	Village Telephone	610-614	RAS
430-440	Amateur Radio		

620-940MHz, 测试天线水平, 垂直极化, 天线指向每隔90度4个方向测到的频谱图



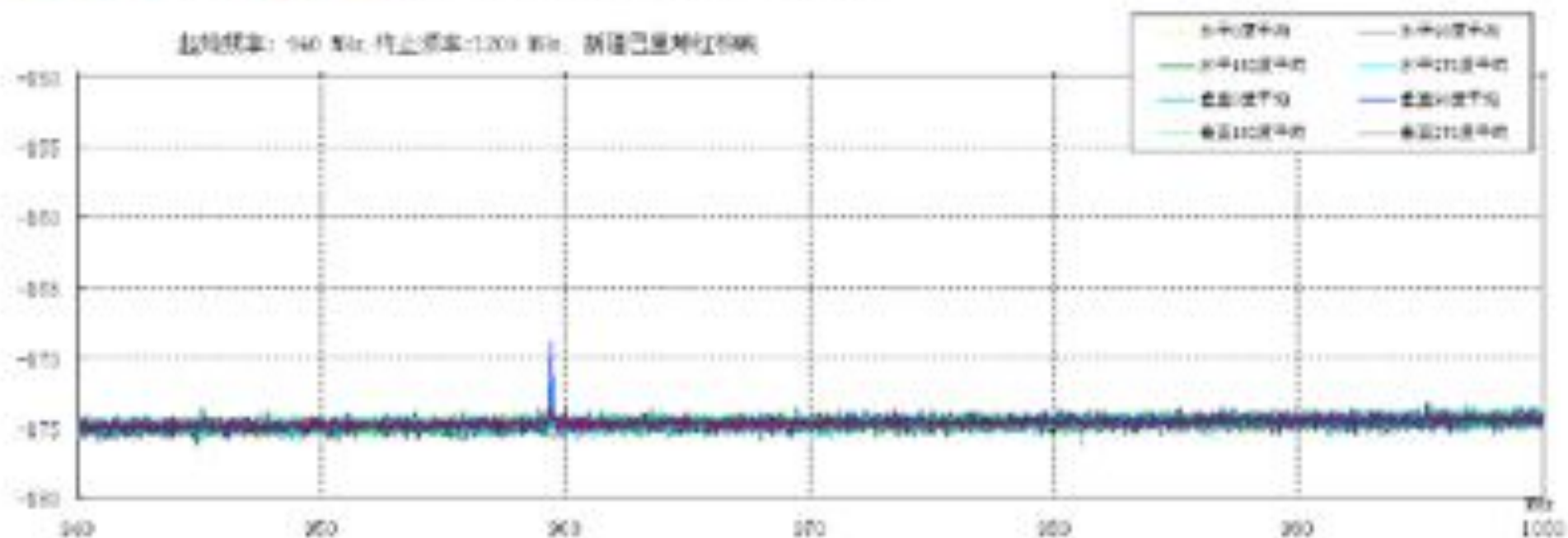
F(MHz)	Service/System
470-862	TV channel 13-56
798-806	Amateur Radio
824-890	CDMA

890-960

GSM

940-1000MHz, 测试天线水平, 垂直极化, 天线指向每隔90度4个方向测到的频谱图

起始频率: 940 MHz, 终止频率: 1000 MHz, 频谱已居频归中



F(MHz)

Service/System

890-960

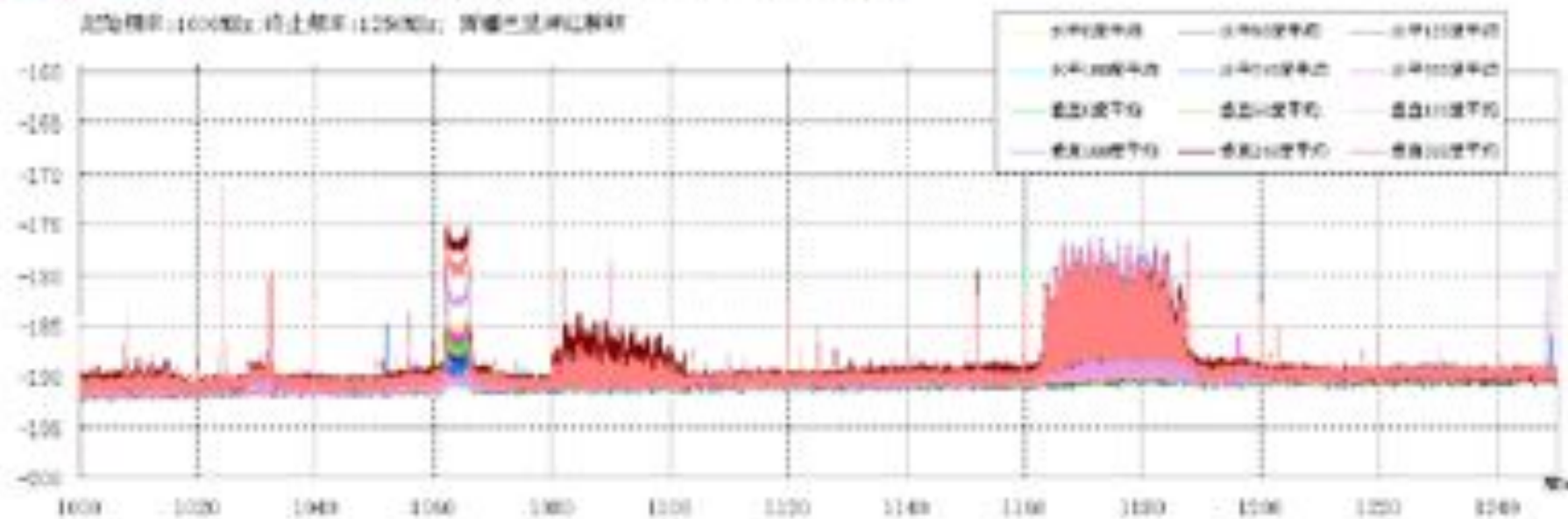
GSM

960-1164

DME

1000-1250MHz, 测试天线水平, 垂直极化, 天线指向每隔60度六个方向测到的频谱图

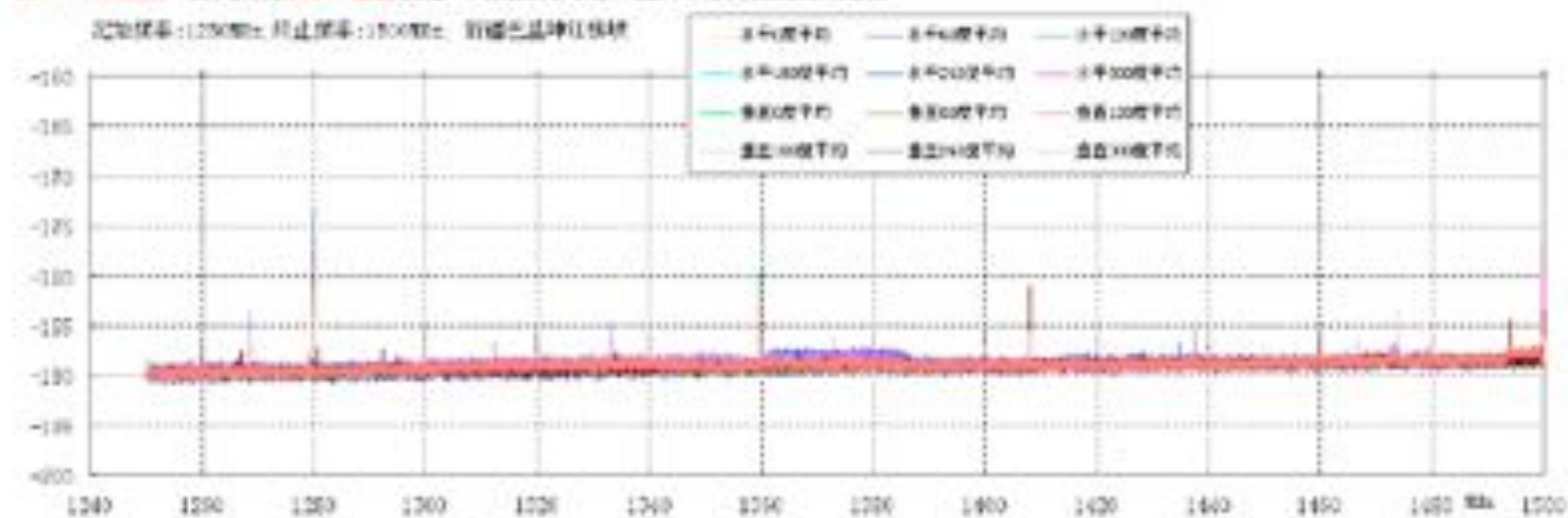
起始频率:1000MHz, 终止频率:1250MHz, 频谱分辨率:100Hz



该段的主要干扰源为: 960-1164MHz 航空无线电导航, 二次雷达, GPS 1227.60 $\pm$ 10 MHz;

F(MHz)	Service/System
1227	GPS L2
960-1164	DME

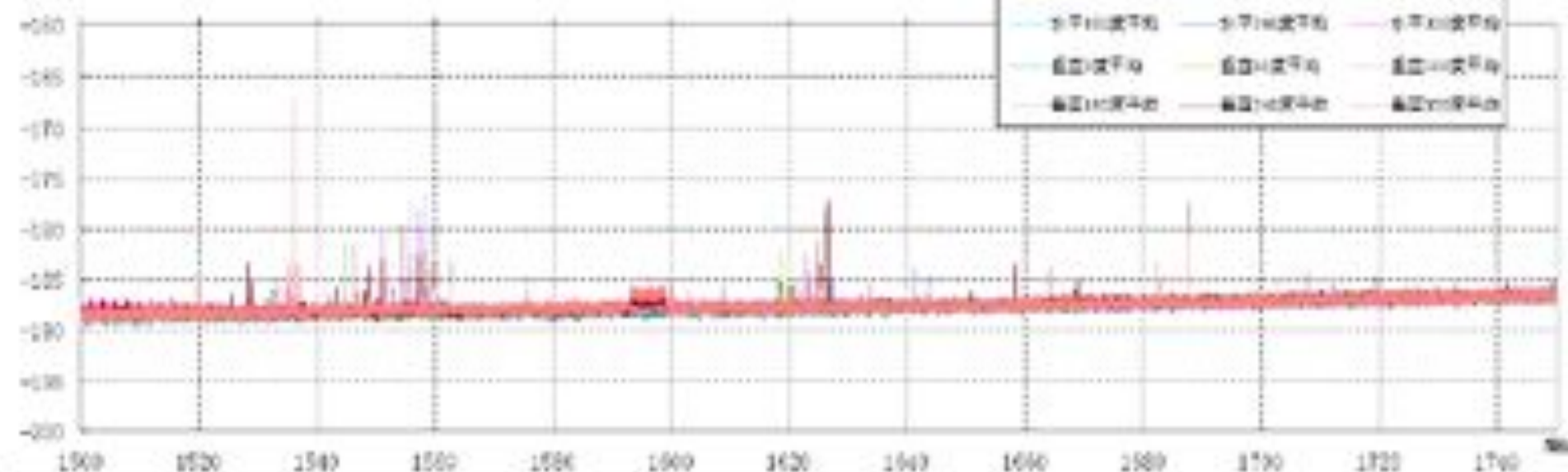
1250-1500MHz, 测试天线水平、垂直极化, 天线指向每隔60度六个方向测到的频谱图



F(MHz)	Service/System	F(MHz)	Service/System
1226.6-1229.6	GPS L2	1400-1427	RAS 未被占用
1246-1259.5±0.51	GLONASS L2	1470-1480	AFRISTAR
1268.52-1267.14	Galileo	1452-1492	Digital Audio Broadcasting satellite
1330-1400	RAS		

1500-1750MHz, 测试天线水平、垂直极化, 天线指向每隔60度六个方向测到的频谱图

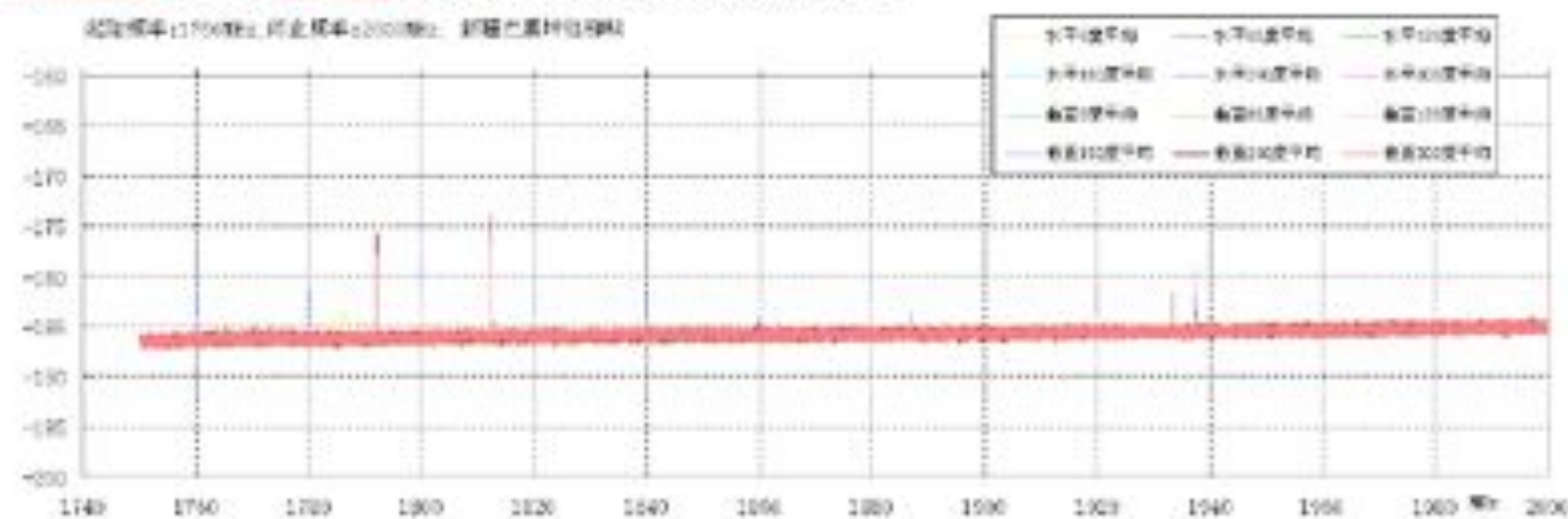
起始频率:1500MHz 终止频率:1750MHz 新频率规划图例



F(MHz)	Service/System	F(MHz)	Service/System
1525-1559	INMARSAT	1660-1660.5	RAS 未被占用
1575.42±10	GPS L1	1660.5-1668	RAS
1602-1615.5±0.51	GLONASS L1	1668.4-1670	RAS未被占用
1610.6-1613.8	RAS 未被占用	1710.1-1725/1805-1820	GSM1800
1613.8-1626.5	Iridium Satellite	1745-1755/1840-1850	CDMA

1710-2000MHz. 测试天线水平、垂直极化, 天线指向每隔60度八个方向测到的频谱图

起始频率1710MHz, 终止频率2000MHz. 频谱范围10MHz



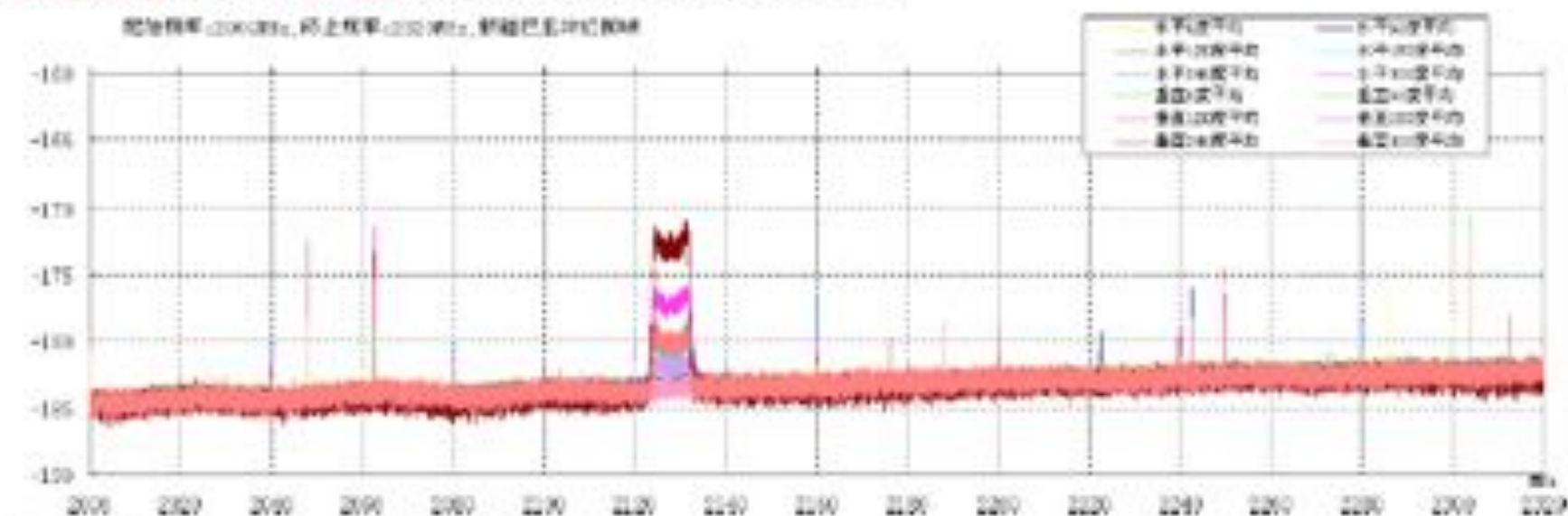
F(MHz) Service/System

1710.1-1880 DCS1800

1880-1900 TD-SCDMA(3G)

1900-1920 PHS

2000.21320MHz, 测试天线水平, 垂直极化, 天线指向每隔60度六个方向测到的频谱图



F(MHz)	Service/System
2010-2025	TD-SCDMA(3G Mobile)
2110-2125	CDMA2000(3G Tele)
2130-2145	WCDMA(3G Unicom)

F(MHz)	Service\System
2400-2480	WIFI
2483.5-2500	Downlink of Global Star
2320-2370	TD-LTE
2575-2635	TD-LTE

F(MHz)	Service\System
4230-4360	microwave signals

F(MHz)	Service\System
2655-2670	RAS
2670-2690	RAS(CHINA)

F(MHz)	Service\System
9320-9370	meteorological radar
10600-10680	RAS
10680-10700	RAS

F(MHz)	Service/System
3000	CPU clock of Computer
3453	Radar

该频段无电联分配的射电天文业务频段。

Radio Astronomy

分配频段	中心频率	保护级别	观测类型
(MHz)	(MHz)	(P,S,N) ^(a)	(CS,SL) ^(b)
13.36—13.41			
25.55—25.67	13.385	P	CS
37.50—38.25	25.61	P	CS
73.0—74.6		S	CS
79.25—80.25	73.8	P2	CS
150.5—153.0	79.75	P3	CS
229.0—235.0	151.75	P	CS
322.0—328.6	232.0	P (C)	CS
324.0—328.6	325.3	P	CS
406.1—410.0	326.3	P (C)	CS
608.0—614.0	408.55	P	CS
1330—1400	611.0	P2, S1, 3	CS
1400—1427	1413.5	N	SL
1610.6—1613.8	1612.2	P	CS+SL
1660.0—1660.5		P	SL
1660.5—1668.4		P	SL
1668.4—1670.0		P	SL
1718.8—1722.2	2250.0	S	SL
2150.0—2350.0		P (C)	CL
2655.0—2690.0	2695.0	S	CS
2690.0—2700.0		P	CS
3260.0—3267.0		N	SL
3332.0—3339.0		N	SL
3345.8—3352.5	4995.0	S	CS+SL
4800.0—4990.0	8400	P	CS
4900.0—5000.0		P (C)	CS
8200.0—8600.0			

- Hong Liu Xia is a good radio site in China.

said by Jianbin Li

Site construction

- Land acquisition for the telescope array: (Mar 28. 2014-Apr 20. 2014)
- Land acquisition for the living area (May 12. 2014)
- Begin time to build the road: 26th July, 2014, which is the same day for the 60th Anniversary for the establishment of the Kazakh Autonomous County



Road



Bridge

2014.8.5-2014.8.31





Antenna foundation :
Sep. 23, 2014-Nov. 8,2014

Install Antenna:
Nov. 10,2014-Dec.8, 2014

- Power Construction: Sep.1 2014-Oct. 20,2014 (3 weeks)
- Set up cable: Oct.21, 2014-Nov. 5, 2014(two weeks)
- 16 dishes: Mar. 15.2015-Apr. 20, 2015 (one month)
- Put the feeds to Cylinder :June. 20 2015- July 10 (three weeks)



Thank you !