GENERAL DYNAMICS
C4 Systems

Antenna Test Report
Test No. 1465

Project: 74cm Series 1741 Ku-Band Rx/Tx Antenna System

PRODELIN®

East Maiden Antenna Test Facility
4488 Lawing Chapel Church Road
Maiden, North Carolina 28650
828-428-1485 / 828-428-1488 fax

GENERAL DYNAMICS
C4 Systems

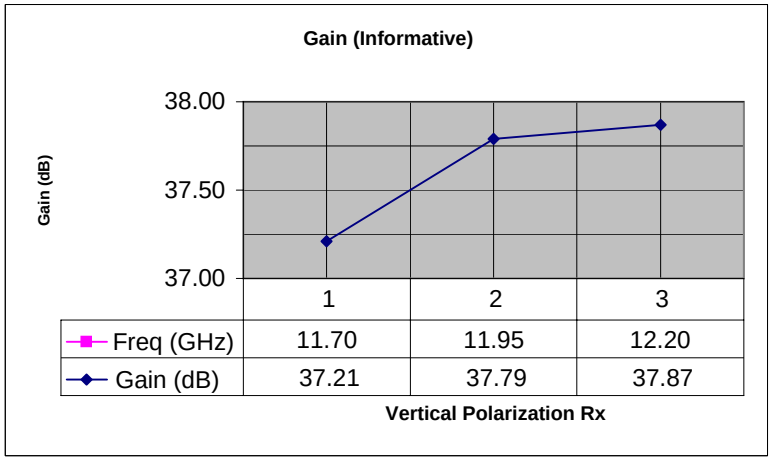
1500 Prodelin Drive
Newton, NC 28658
828-464-4141

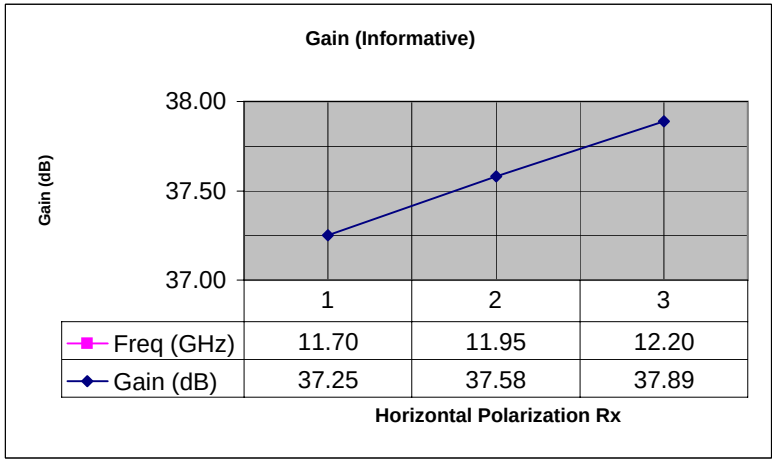
Table of Contents

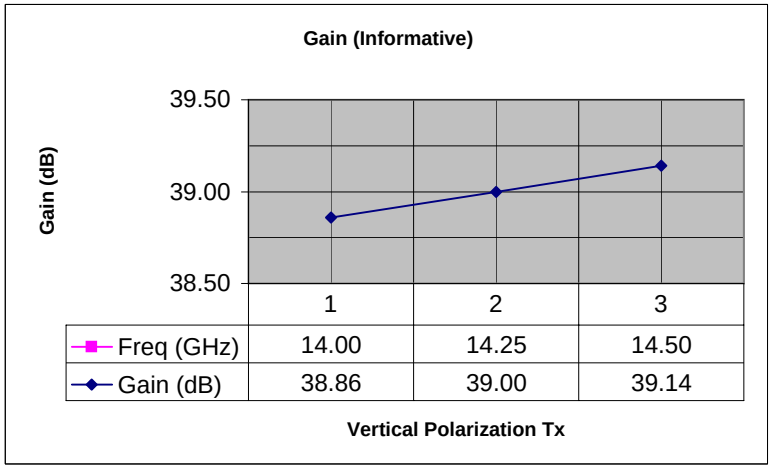
Section I

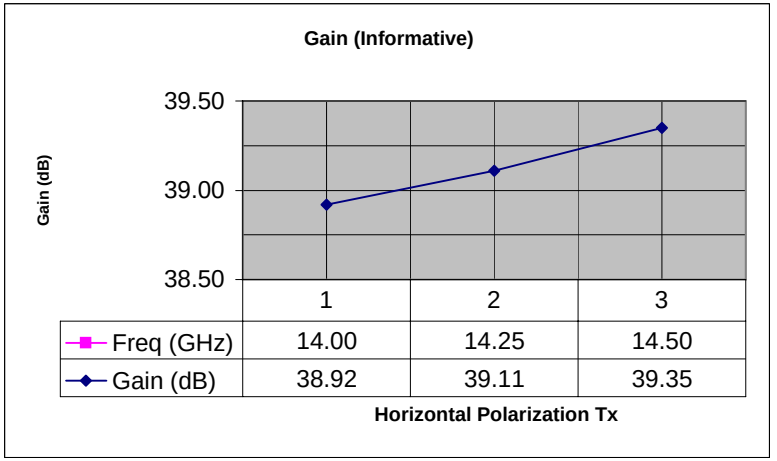
Project: 74cm Series 1742 Antenna System
Test No.1465

Gain Analysis







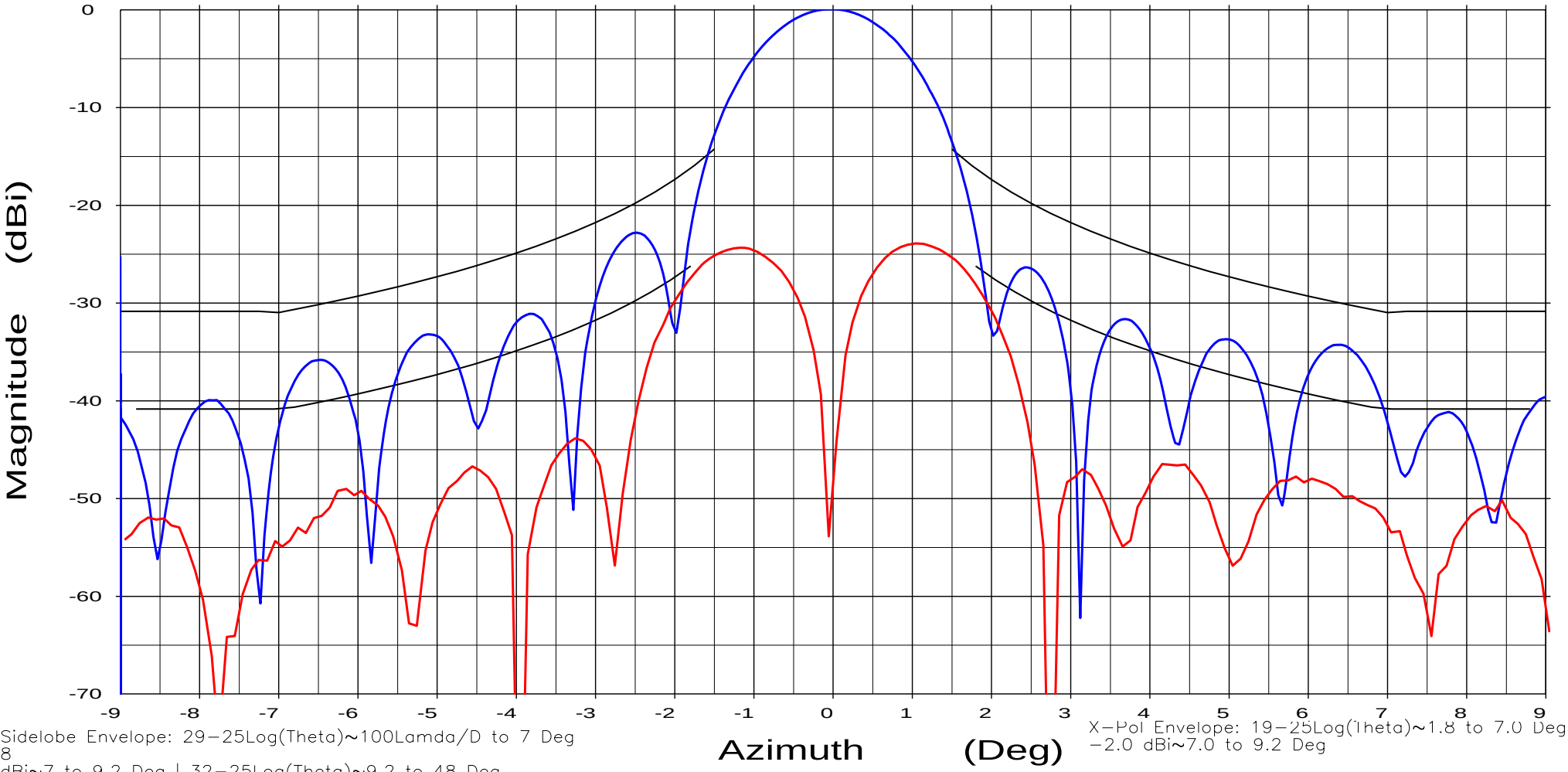


Section II

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.000 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg

X−Pol Envelope: 19−25Log(Theta)~1.8 to 7.0 Deg
−2.0 dBi~7.0 to 9.2 Deg

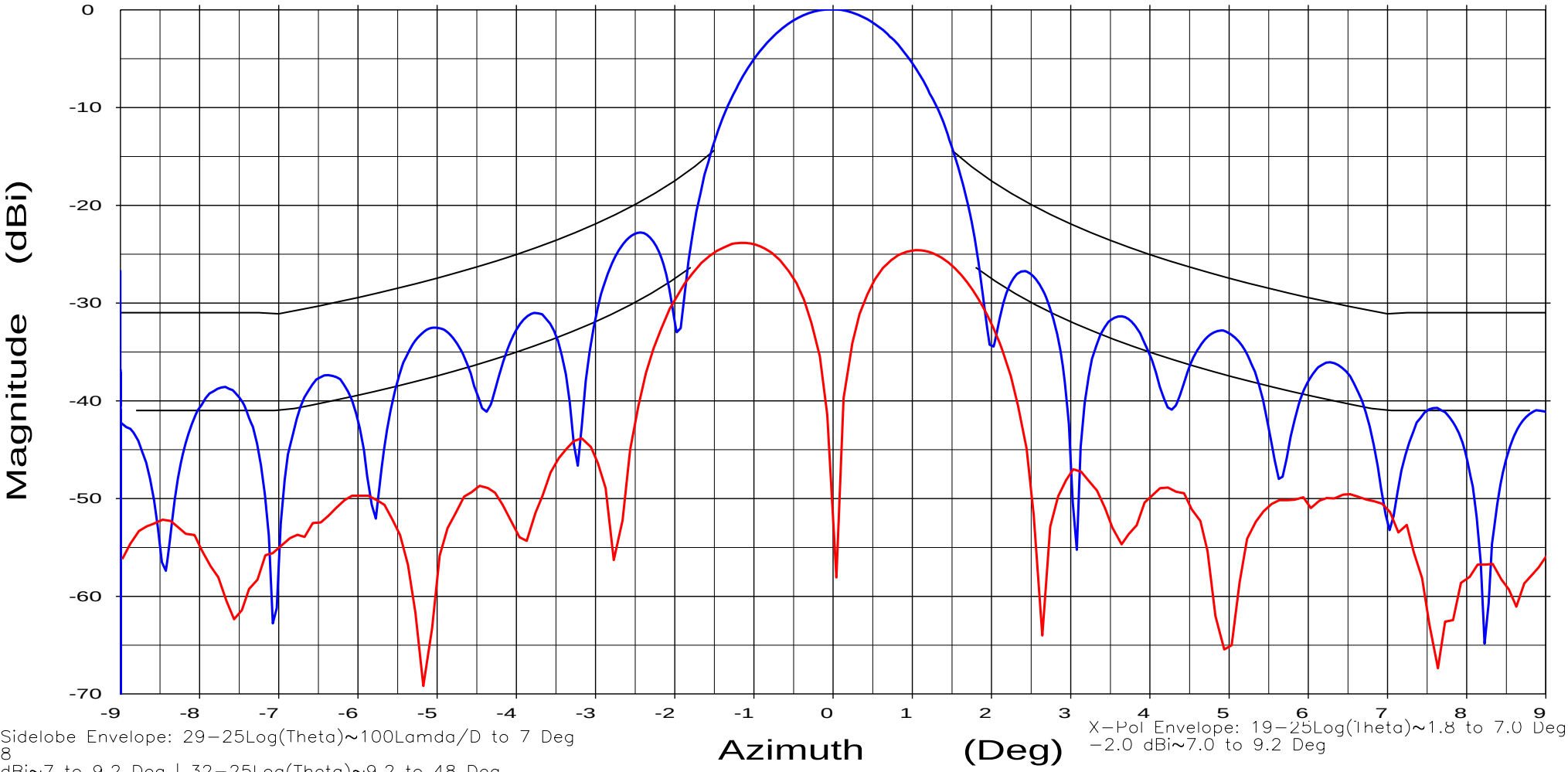
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-17.dat-ant_under_test	1458-17.dat	dBi	-0.02	0.06
1458/65-25.dat-ant_under_test	1458-25.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.250 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg

X−Pol Envelope: 19−25Log(Theta)~1.8 to 7.0 Deg
−2.0 dBi~7.0 to 9.2 Deg

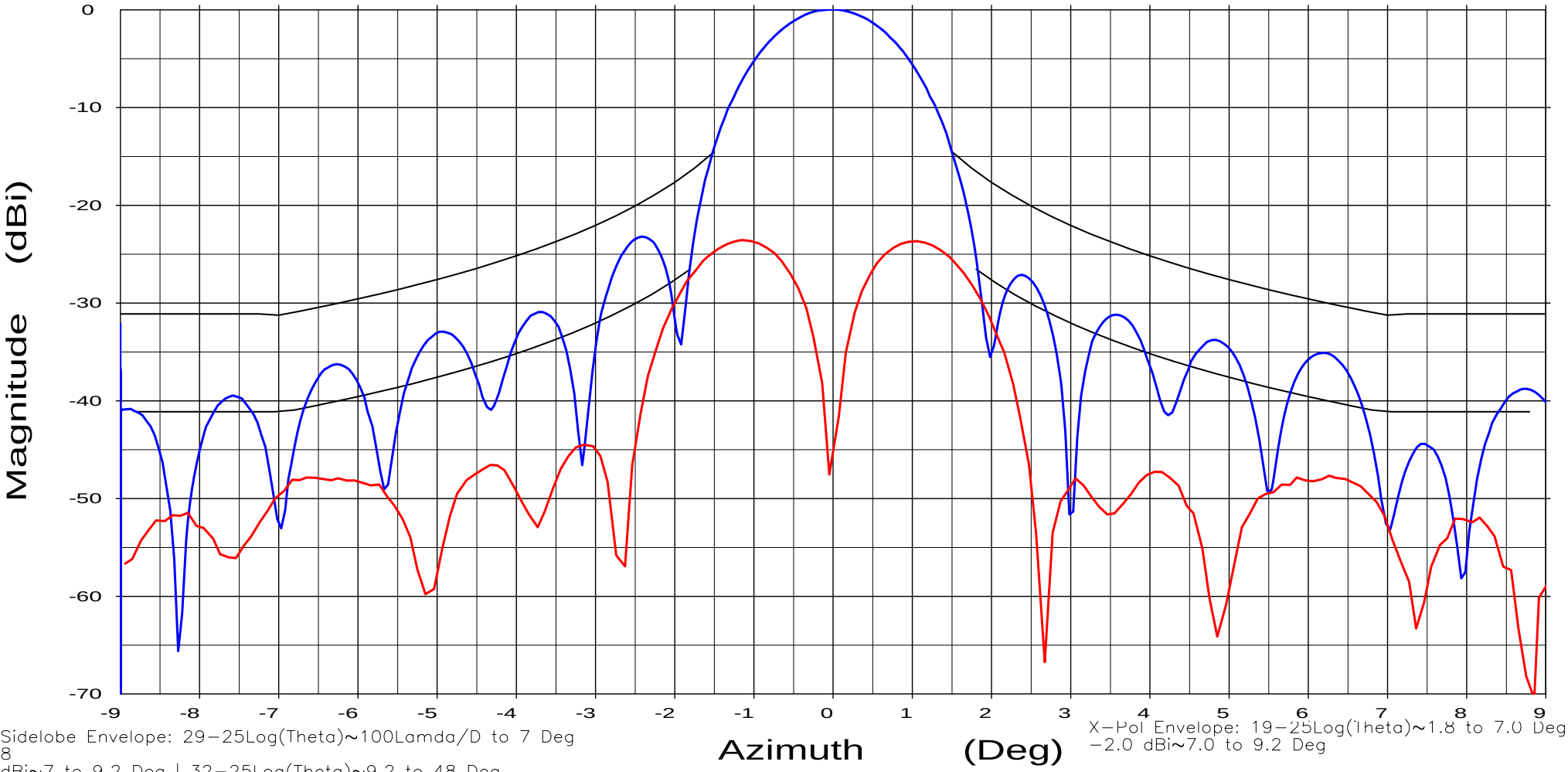
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-17.dat-ant_under_test	1458-17.dat	dBi	-0.02	0.04
1458/65-24.dat-ant_under_test	1458-24.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.500 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg

X−Pol Envelope: 19−25Log(Theta)~1.8 to 7.0 Deg
−2.0 dBi~7.0 to 9.2 Deg

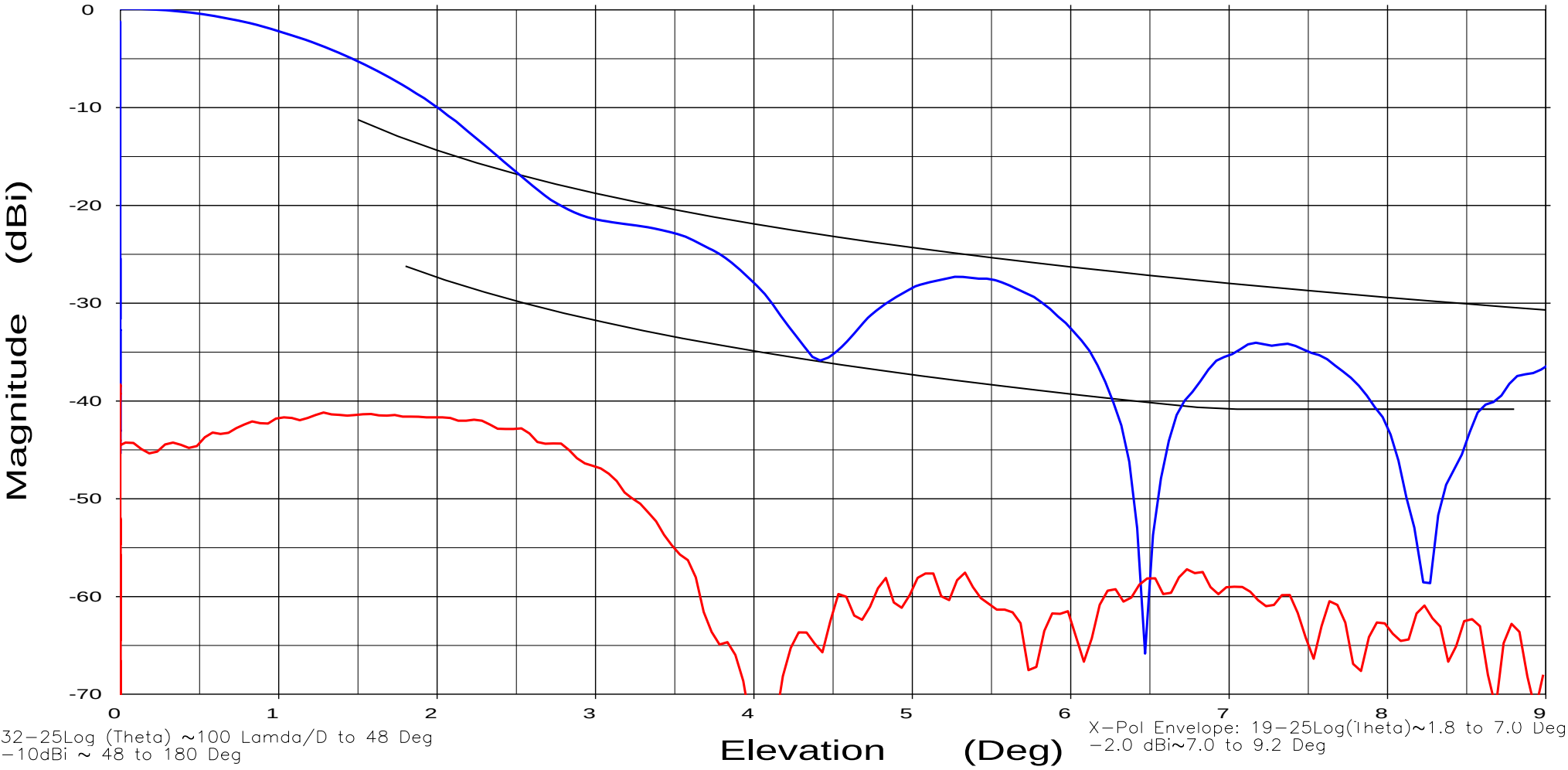
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-17.dat-ant_under_test	1458-17.dat	dBi	-0.02	0.04
1458/65-24.dat-ant_under_test	1458-24.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.000 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



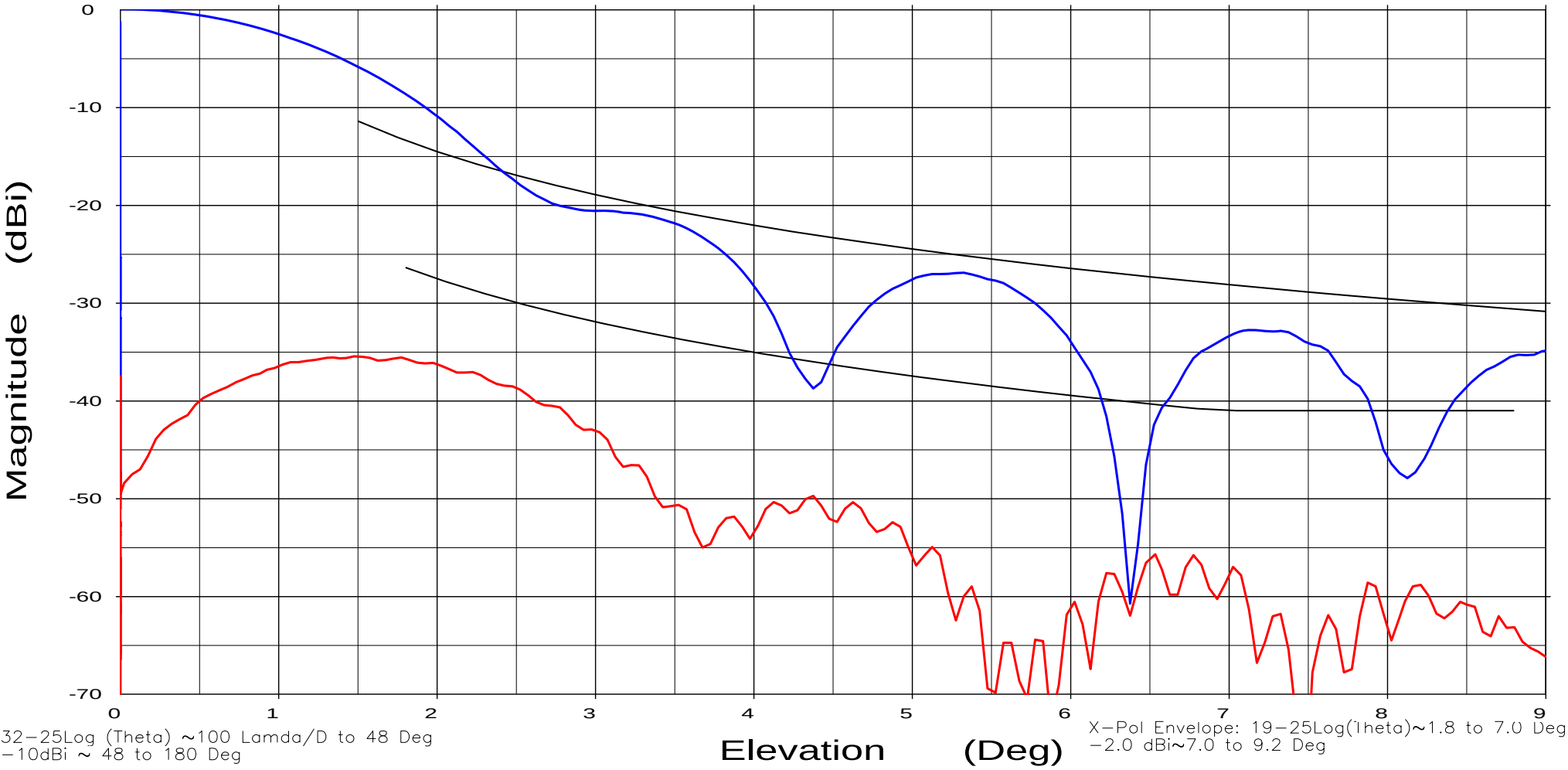
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-18.dat-ant_under_test	1458-18.dat	dBi	-0.01	0.12
1458/65-22.dat-ant_under_test	1458-22.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.250 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



32−25Log (Theta) ~100 Lamda/D to 48 Deg
−10dBi ~ 48 to 180 Deg

X−Pol Envelope: 19−25Log(Theta)~1.8 to 7.0 Deg
−2.0 dBi~7.0 to 9.2 Deg

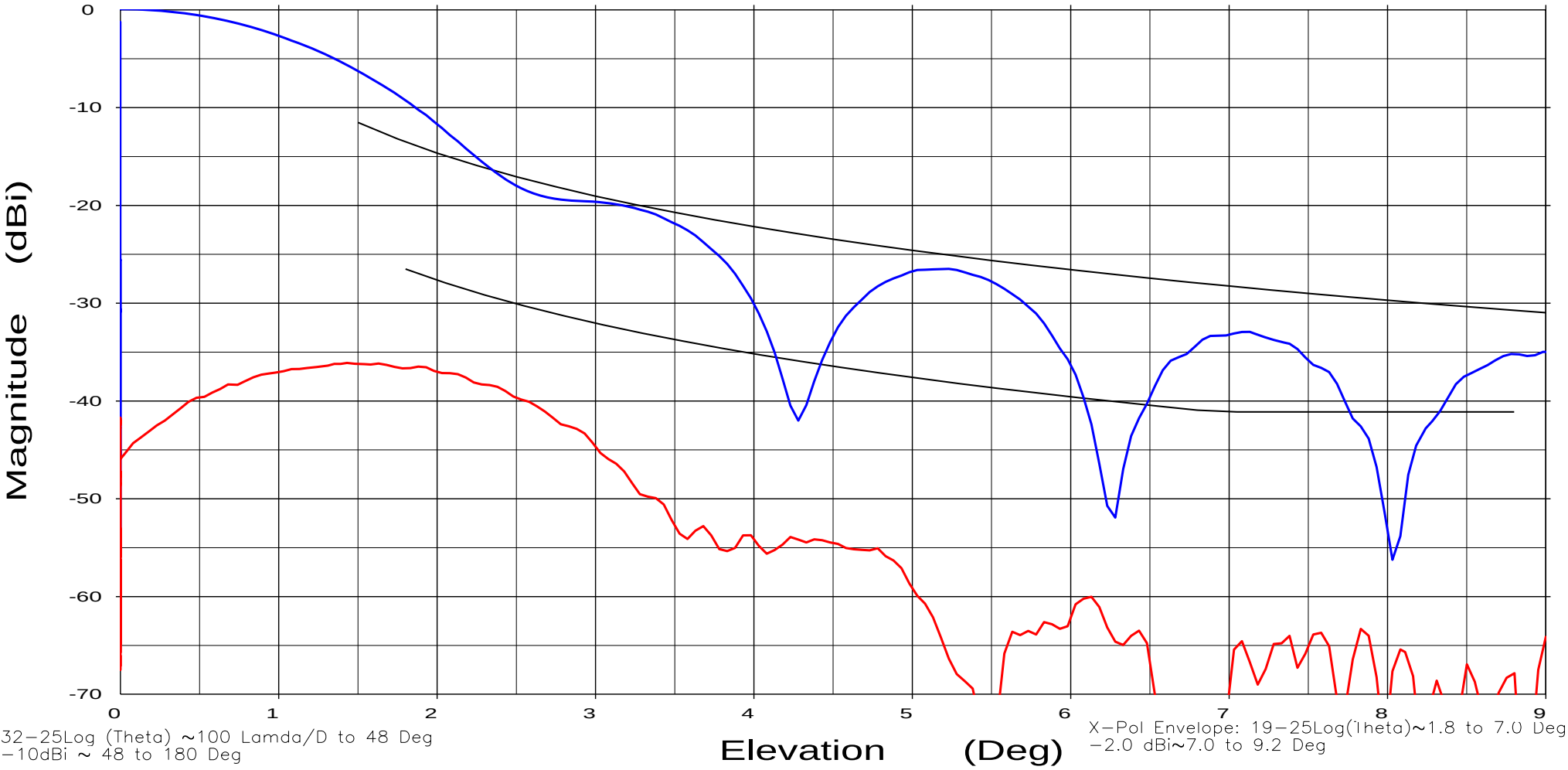
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-18.dat-ant_under_test	1458-18.dat	dBi	-0.04	0.07
1458/65-20.dat-ant_under_test	1458-20.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.500 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



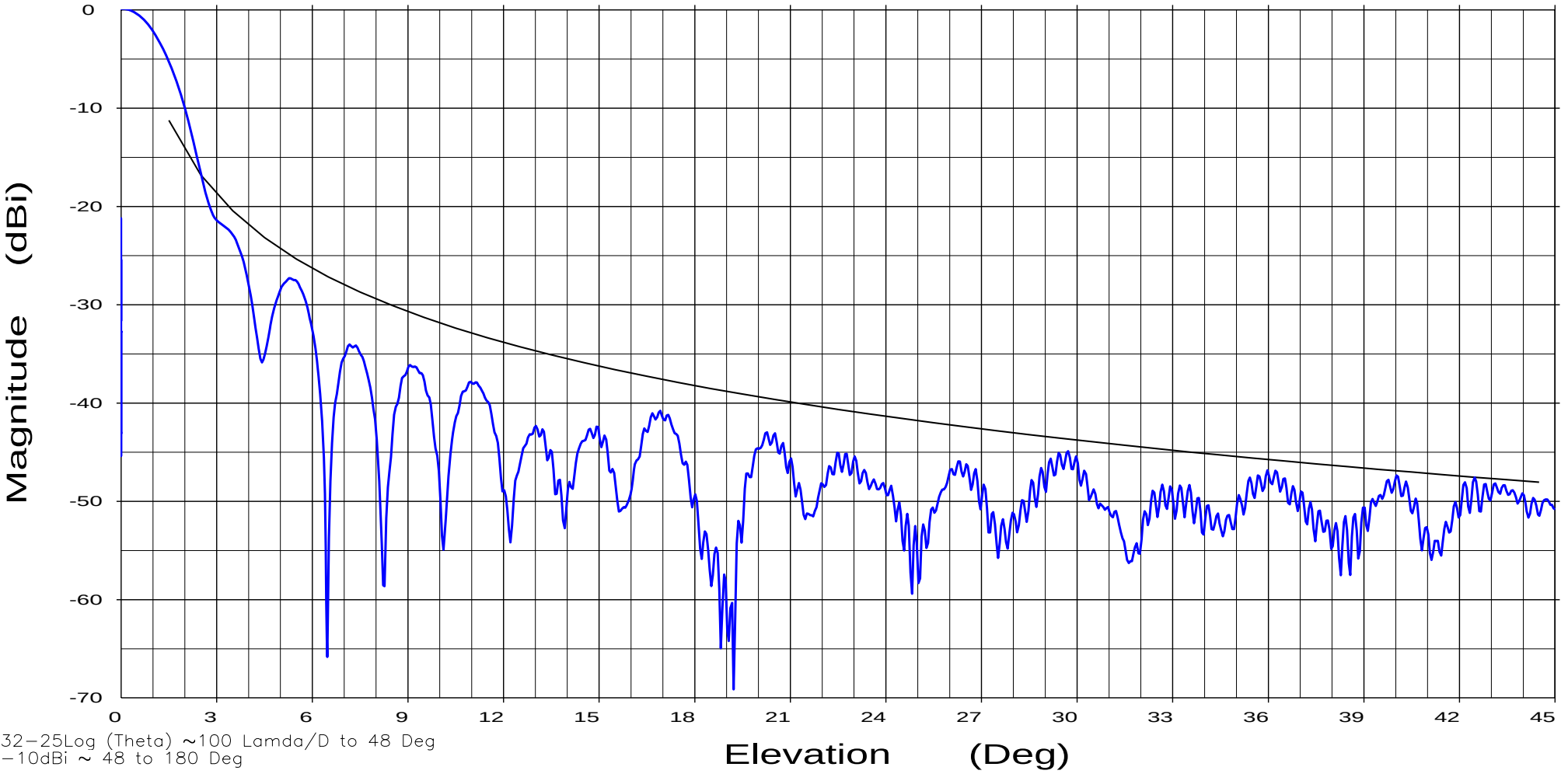
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-18.dat-ant_under_test	1458-18.dat	dBi	-0.04	0.09
1458/65-20.dat-ant_under_test	1458-20.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.000 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



32-25Log (Theta) ~100 Lamda/D to 48 Deg
-10dBi ~ 48 to 180 Deg

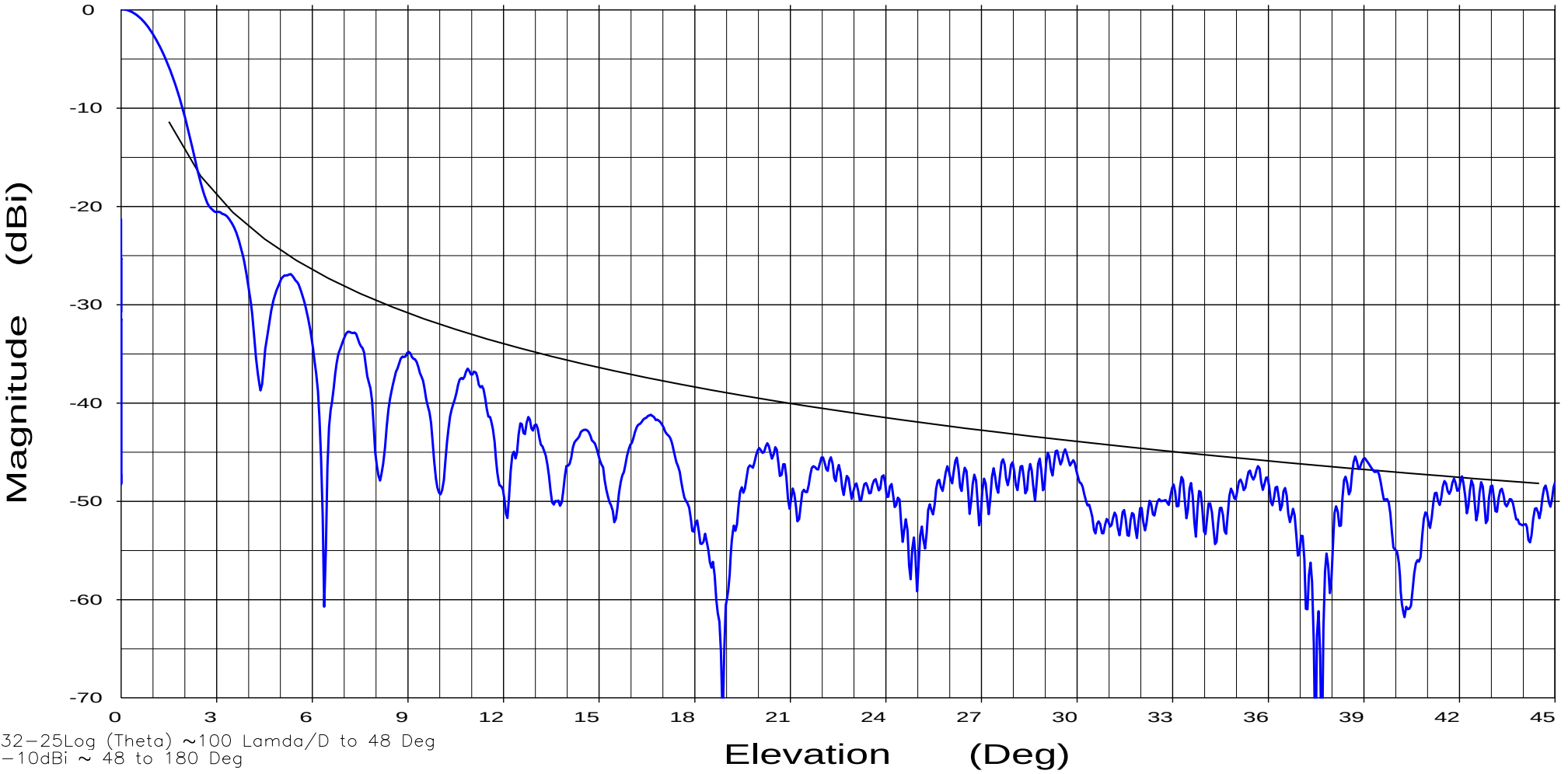
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-18.dat-ant_under_test	1458-18.dat	dBi	-0.01	0.12

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.250 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



32-25Log (Theta) ~100 Lamda/D to 48 Deg
-10dBi ~ 48 to 180 Deg

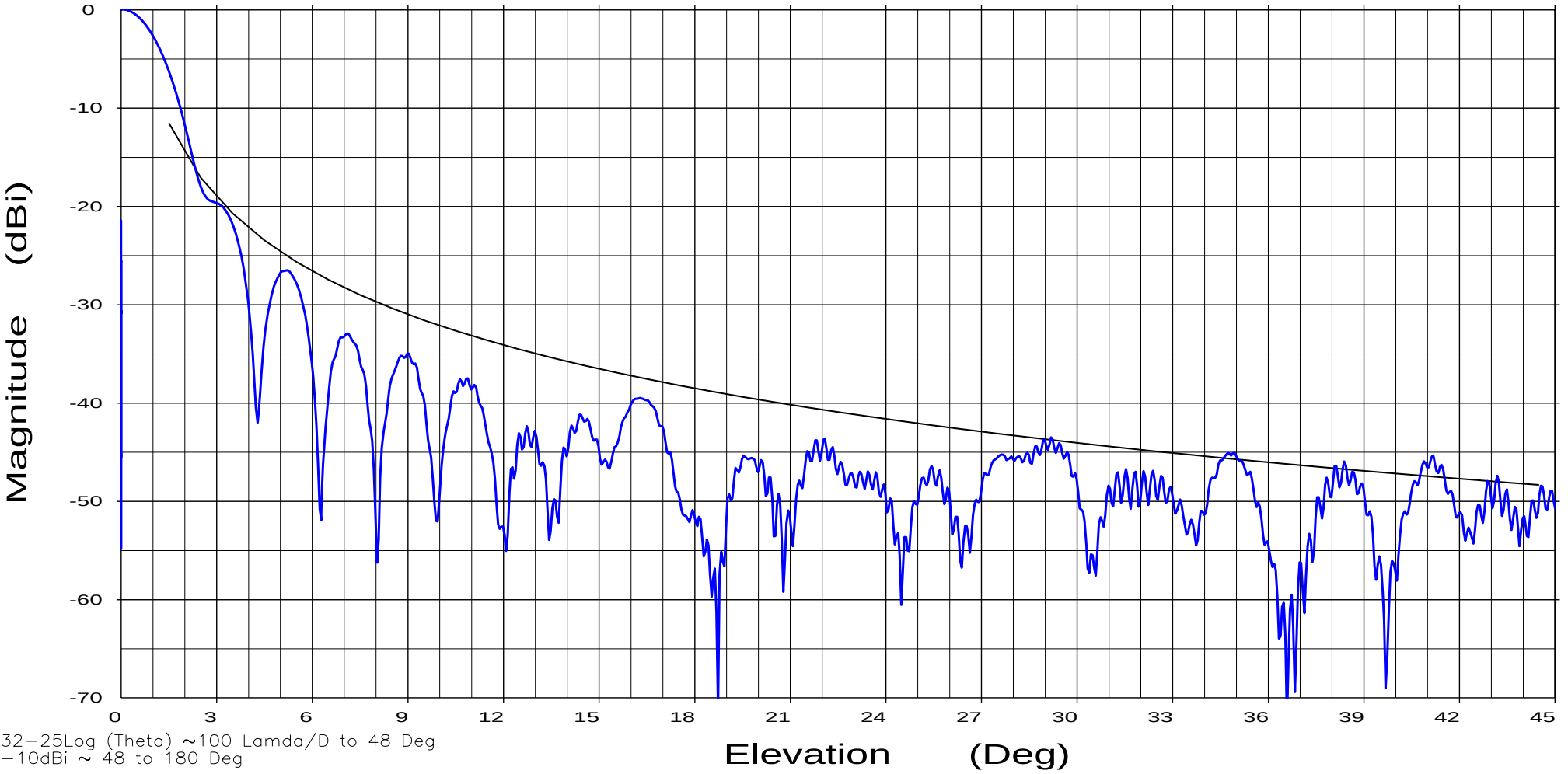
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-18.dat-ant_under_test	1458-18.dat	dBi	-0.04	0.07

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.500 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



32-25Log (Theta) ~100 Lamda/D to 48 Deg
-10dBi ~ 48 to 180 Deg

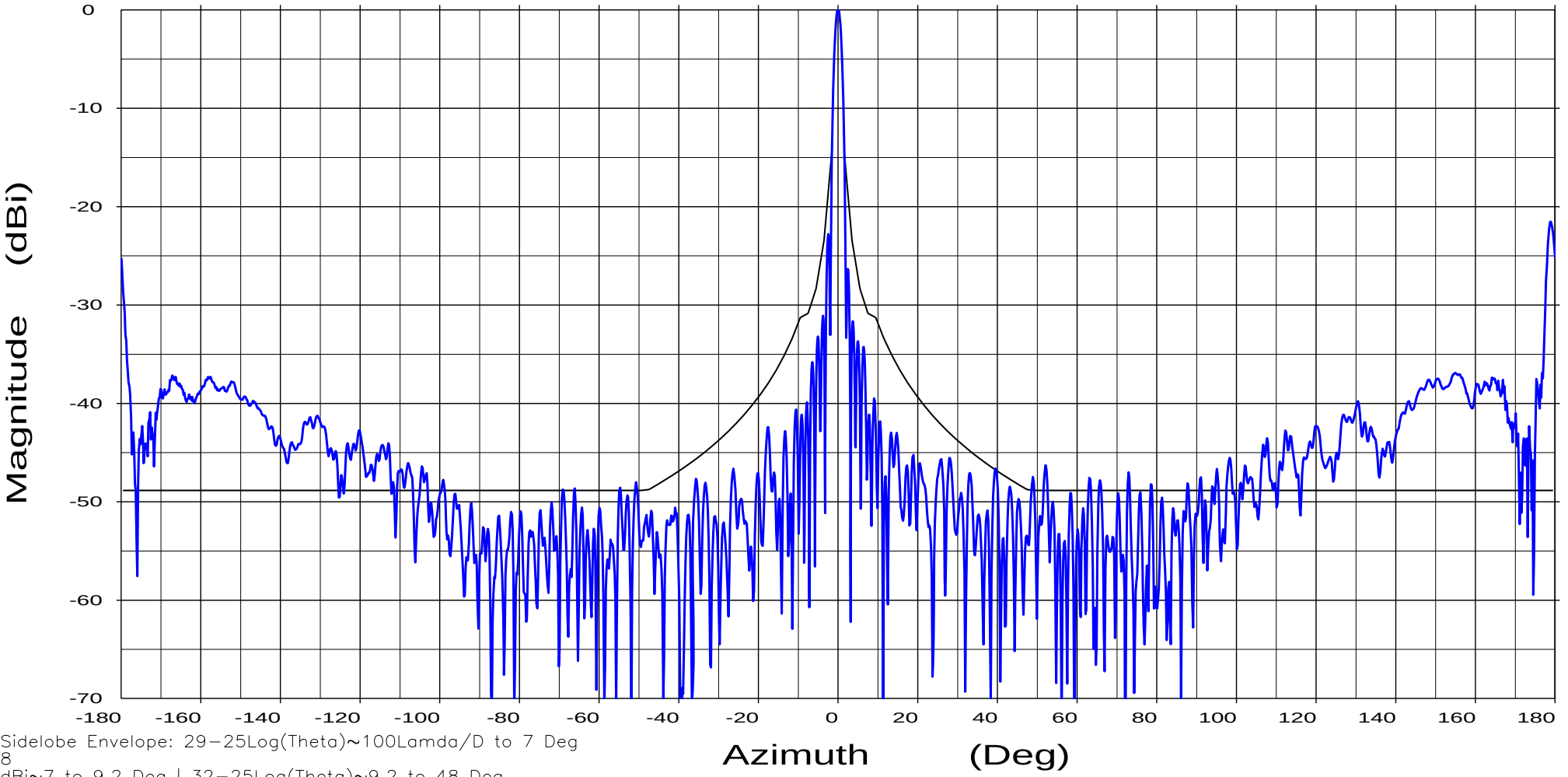
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-18.dat-ant_under_test	1458-18.dat	dBi	-0.04	0.09

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.000 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29-25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg

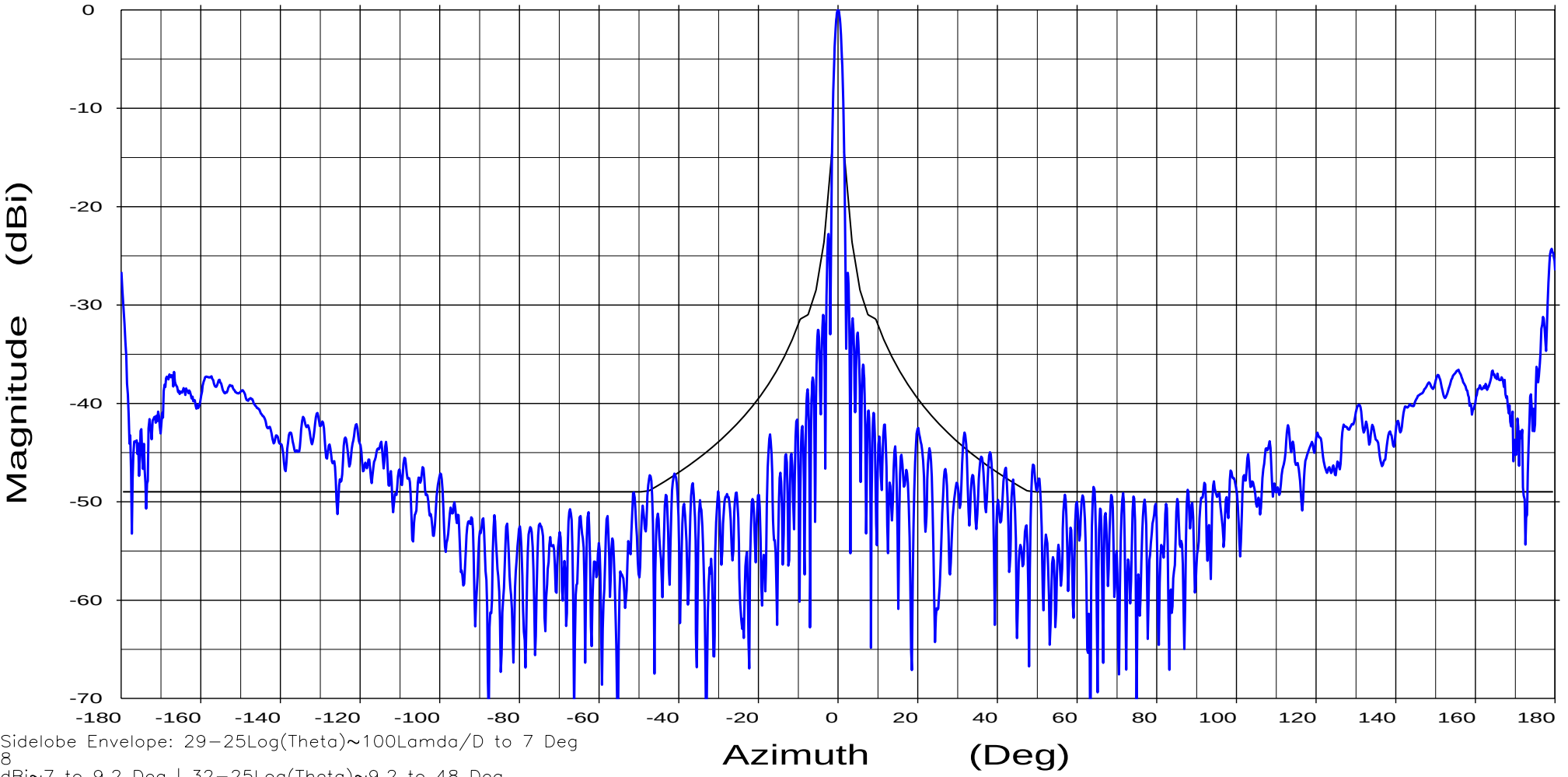
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-17.dat-ant_under_test	1458-17.dat	dBi	-0.02	0.06

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.250 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29-25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg

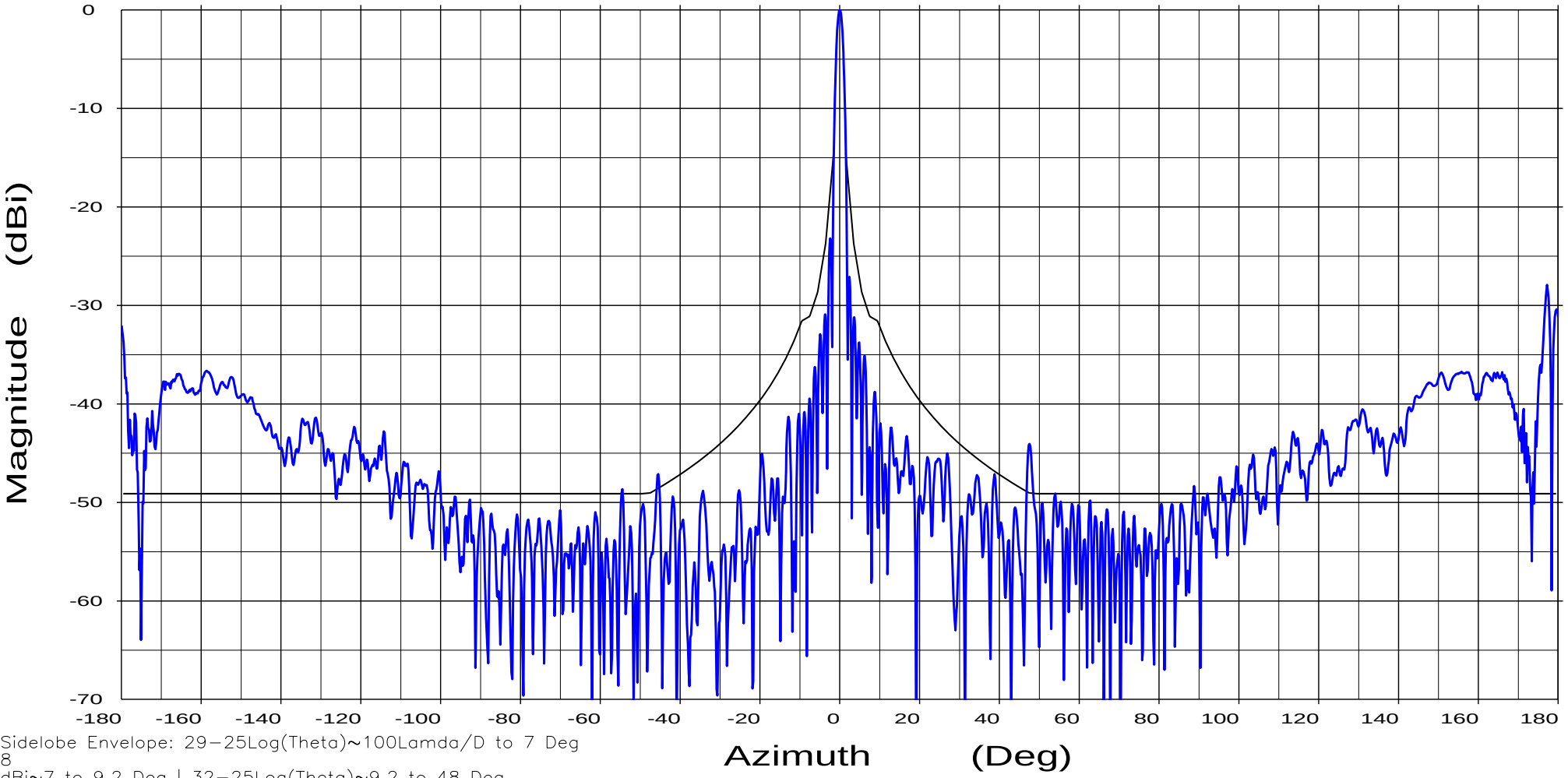
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-17.dat-ant_under_test	1458-17.dat	dBi	-0.02	0.04

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.500 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-17.dat-ant_under_test	1458-17.dat	dBi	-0.02	0.04

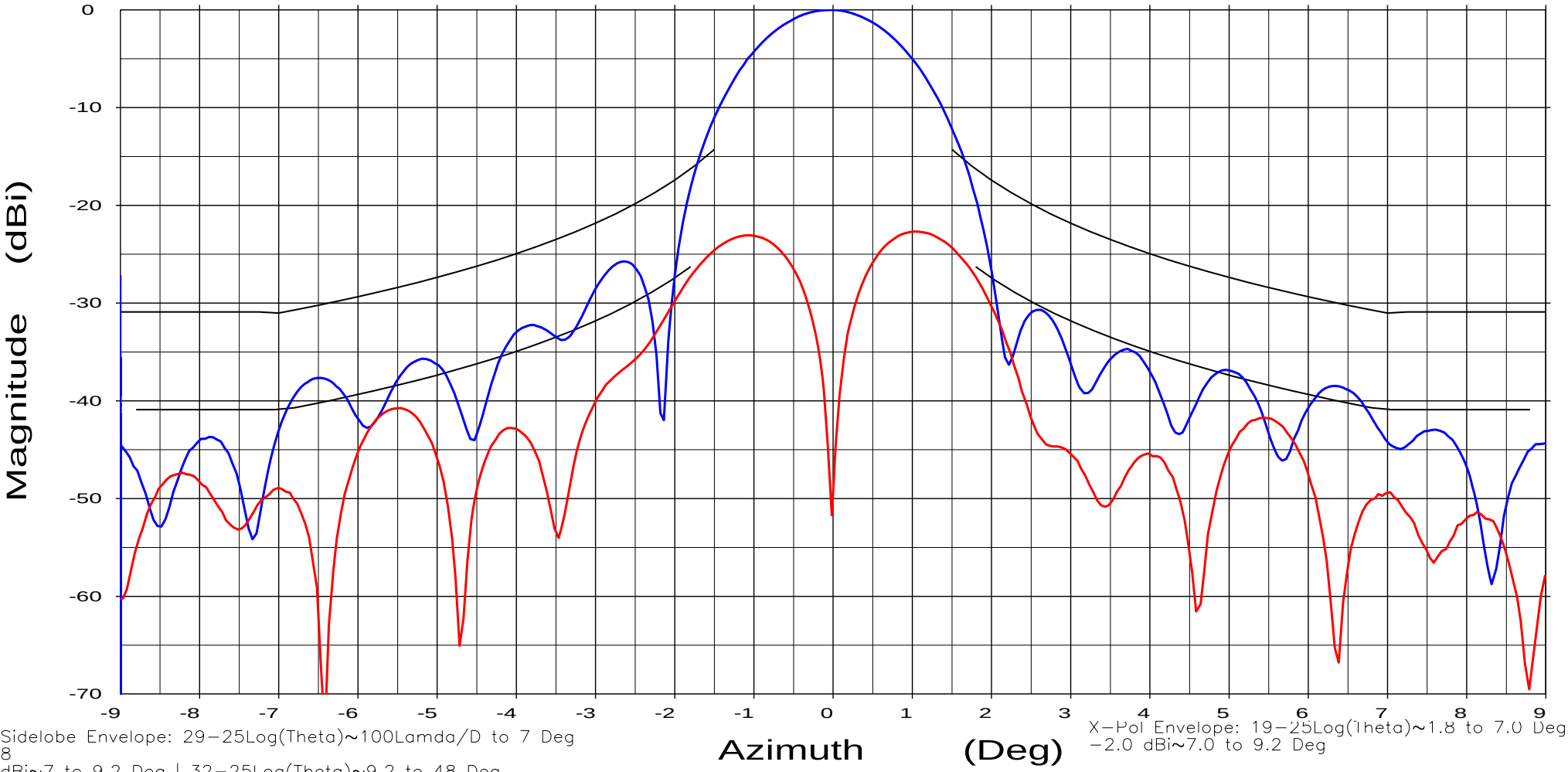
Prodelin Corporation
East Maiden Test Range
Maiden NC

Section III

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.000 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz. Rx pol: Horz.



Sidelobe Envelope: 29-25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg

X-Pol Envelope: 19-25Log(Theta)~1.8 to 7.0 Deg
-2.0 dBi~7.0 to 9.2 Deg

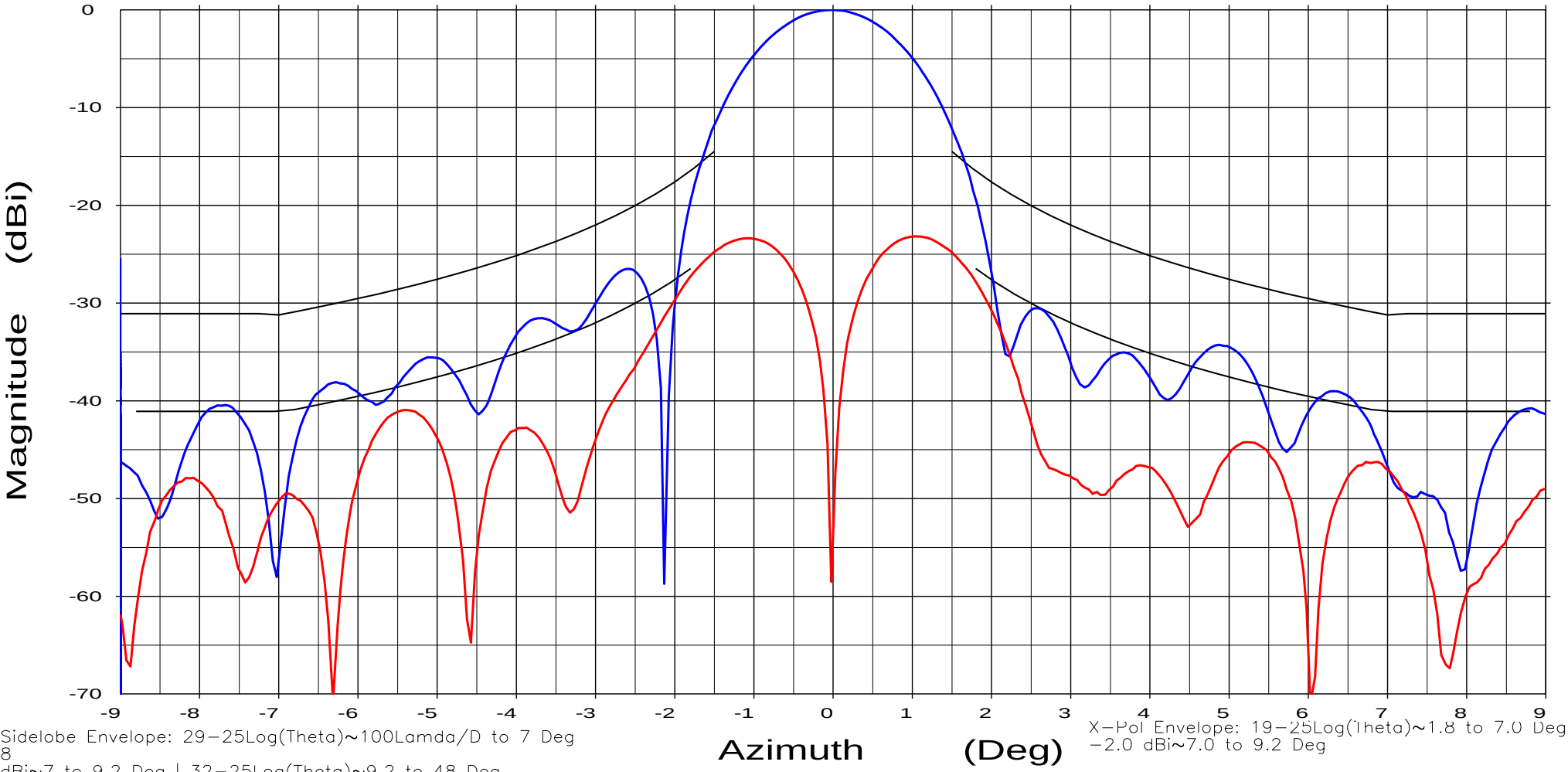
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-10.dat-ant_under_test	1458-10.dat	dBi	-0.04	-0.01
1458/65-12.dat-ant_under_test	1458-12.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.250 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz. Rx pol: Horz.



Sidelobe Envelope: 29-25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg

X-Pol Envelope: 19-25Log(Theta)~1.8 to 7.0 Deg
-2.0 dBi~7.0 to 9.2 Deg

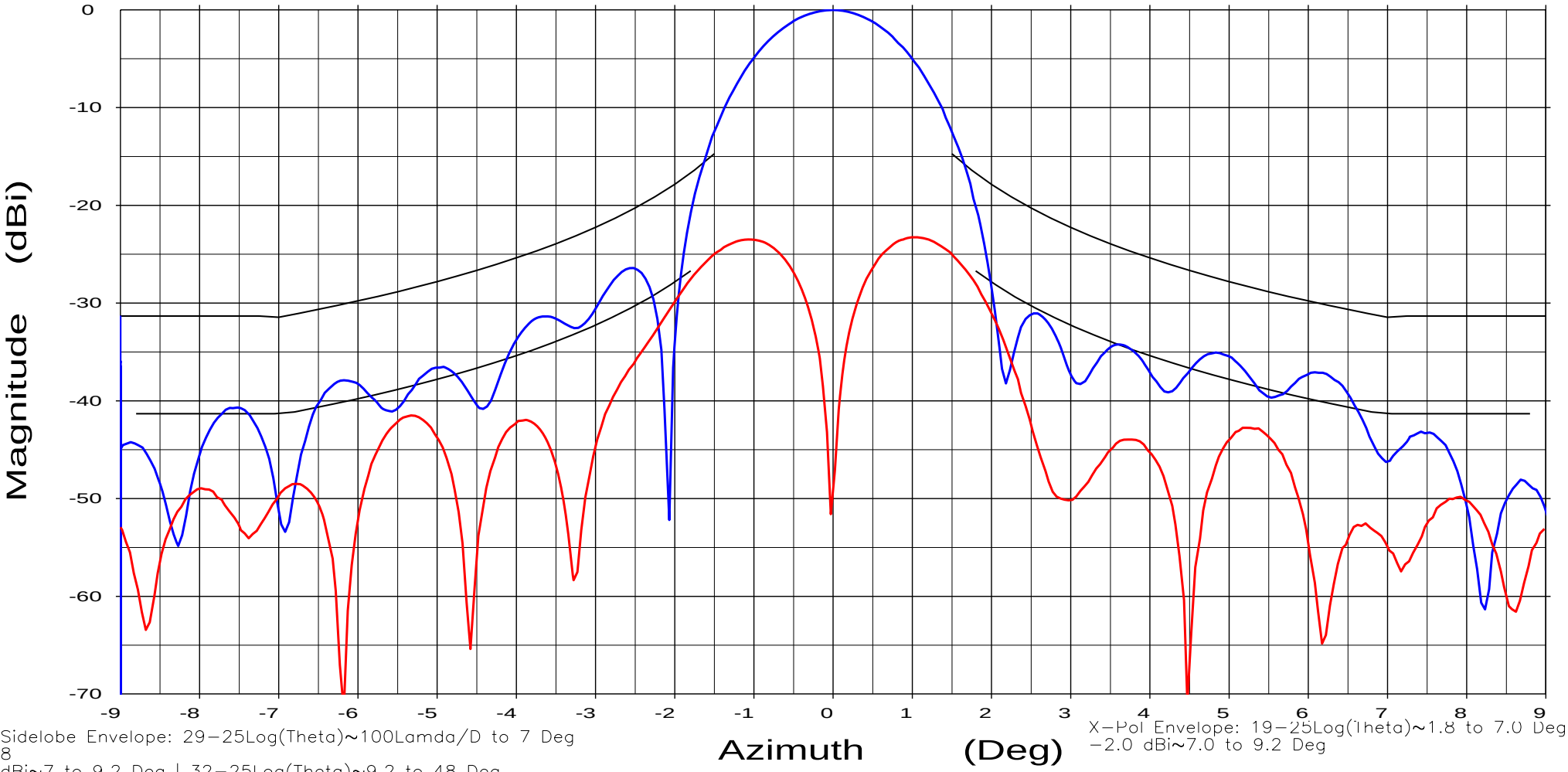
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-10.dat-ant_under_test	1458-10.dat	dBi	-0.02	-0.01
1458/65-12.dat-ant_under_test	1458-12.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.500 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz. Rx pol: Horz.



Sidelobe Envelope: 29-25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg

X-Pol Envelope: 19-25Log(Theta)~1.8 to 7.0 Deg
-2.0 dBi~7.0 to 9.2 Deg

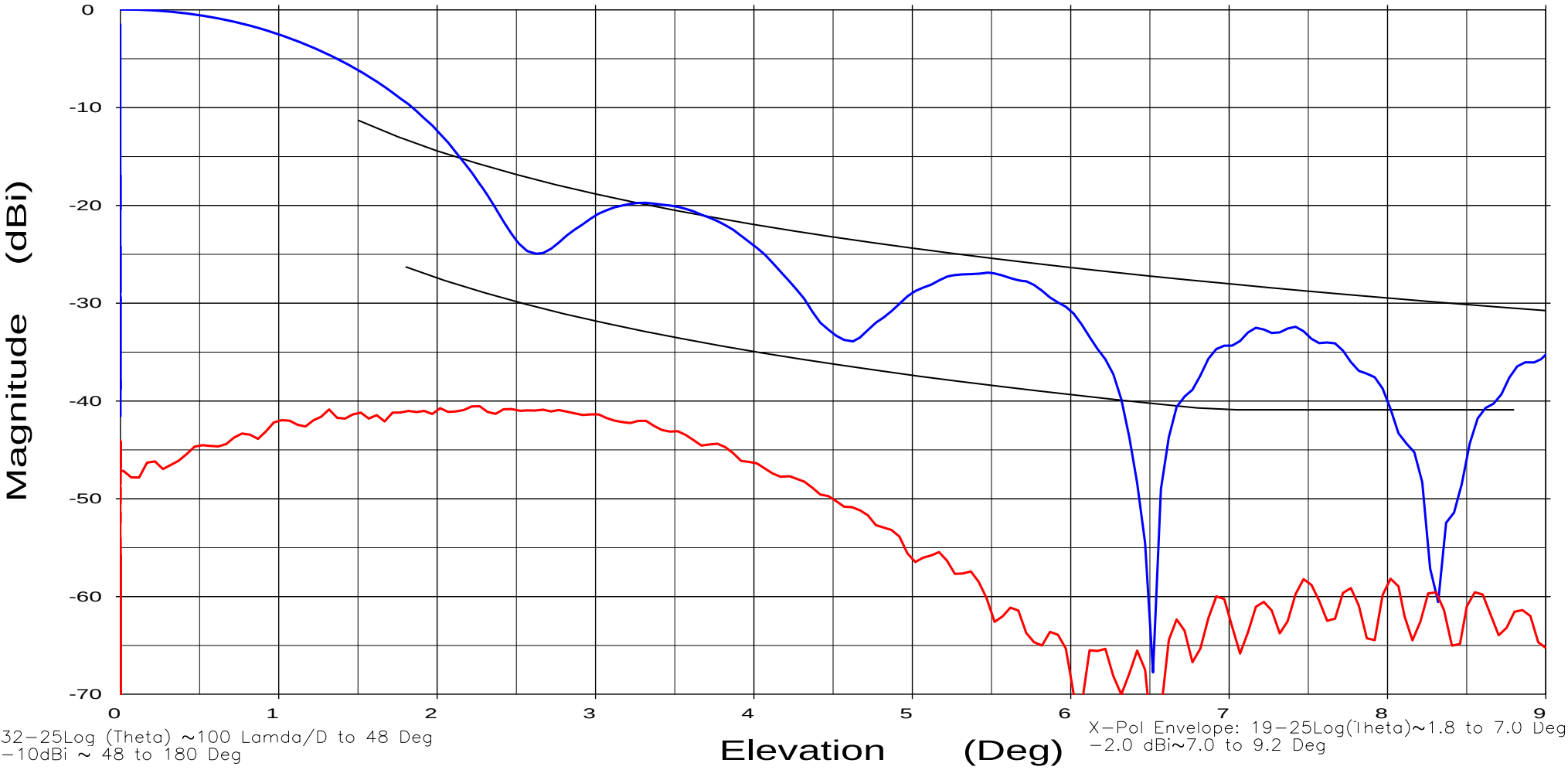
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-10.dat-ant_under_test	1458-10.dat	dBi	-0.01	-0.03
1458/65-12.dat-ant_under_test	1458-12.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.000 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz Rx pol: Horz



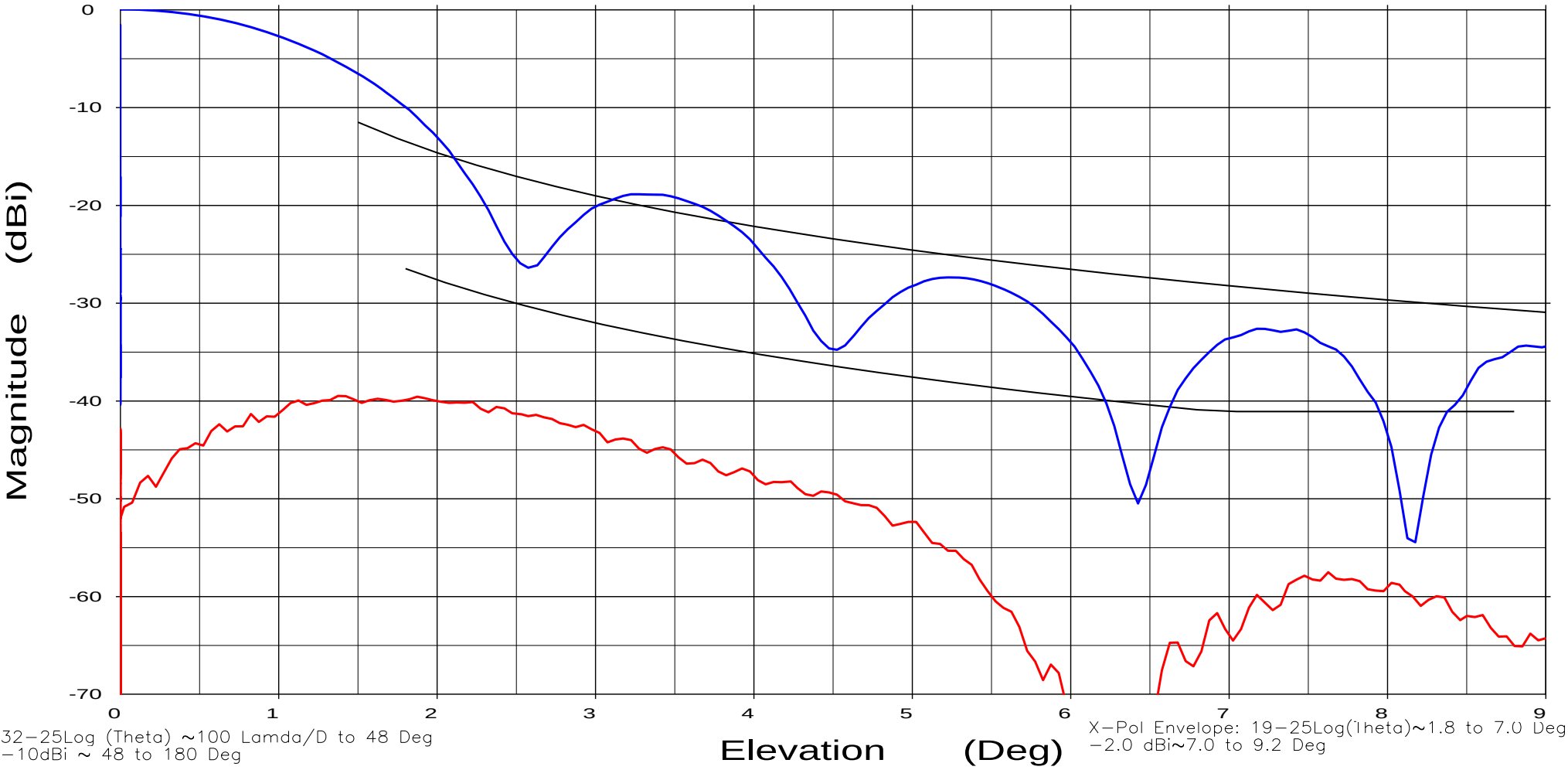
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-11.dat-ant_under_test	1458-11.dat	dBi	0.00	0.04
1458/65-13.dat-ant_under_test	1458-13.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.250 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz Rx pol: Horz



32−25Log (Theta) ~100 Lamda/D to 48 Deg
−10dBi ~ 48 to 180 Deg

X−Pol Envelope: 19−25Log(Theta)~1.8 to 7.0 Deg
−2.0 dBi~7.0 to 9.2 Deg

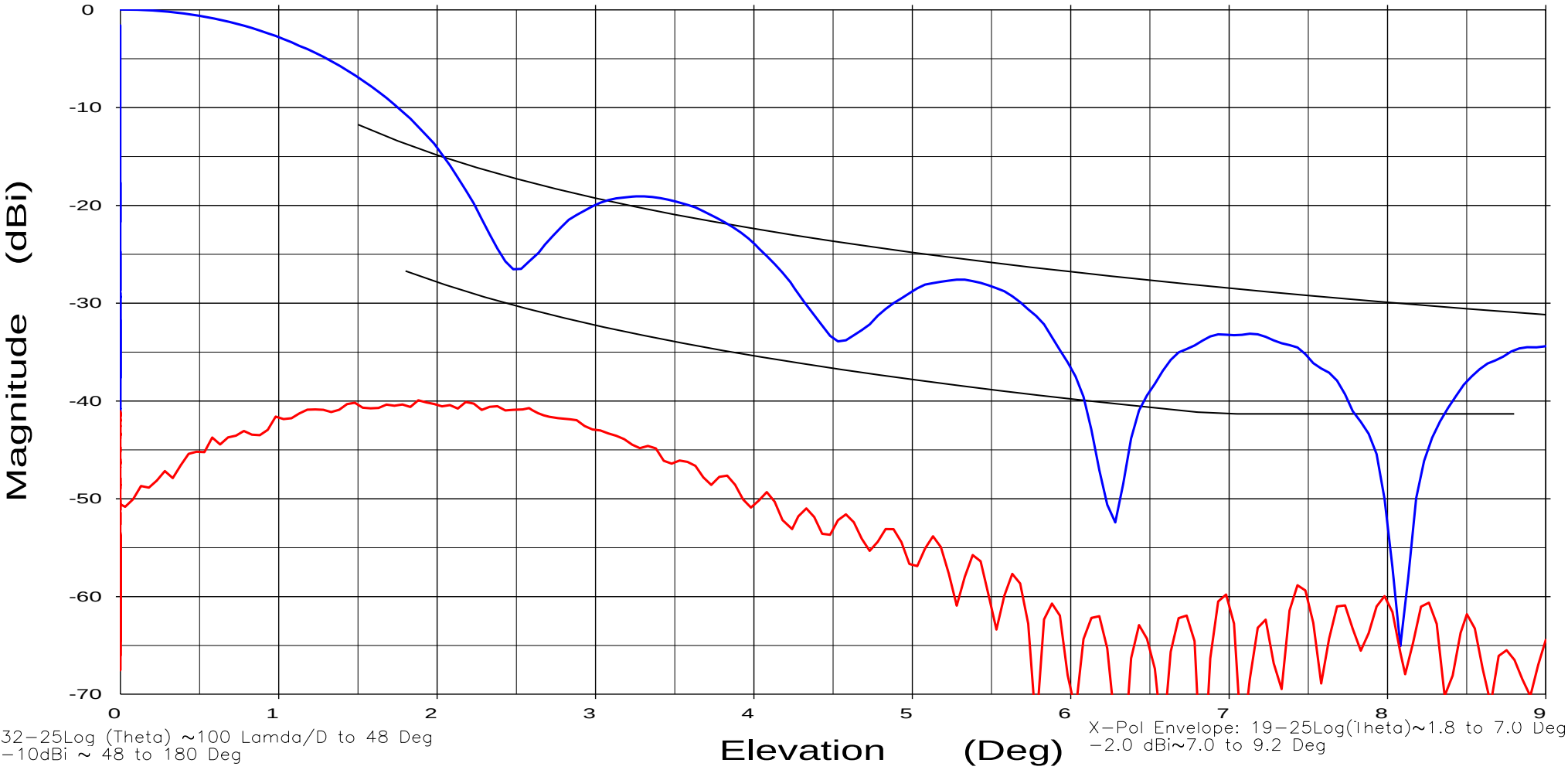
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-11.dat-ant_under_test	1458-11.dat	dBi	-0.01	0.04
1458/65-13.dat-ant_under_test	1458-13.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.500 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz Rx pol: Horz



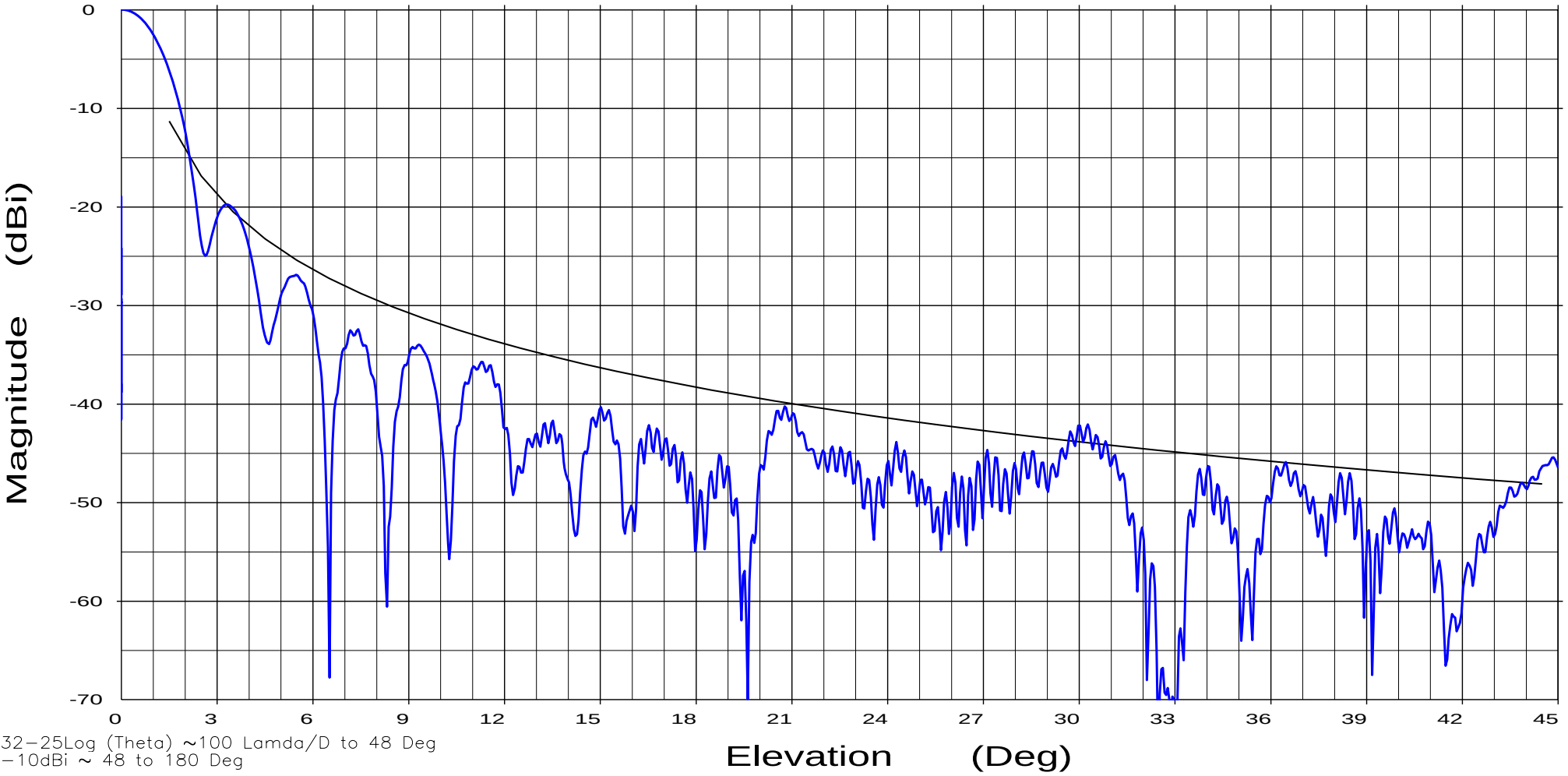
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-11.dat-ant_under_test	1458-11.dat	dBi	-0.00	0.03
1458/65-13.dat-ant_under_test	1458-13.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.000 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz Rx pol: Horz



32-25Log (Theta) ~100 Lamda/D to 48 Deg
-10dBi ~ 48 to 180 Deg

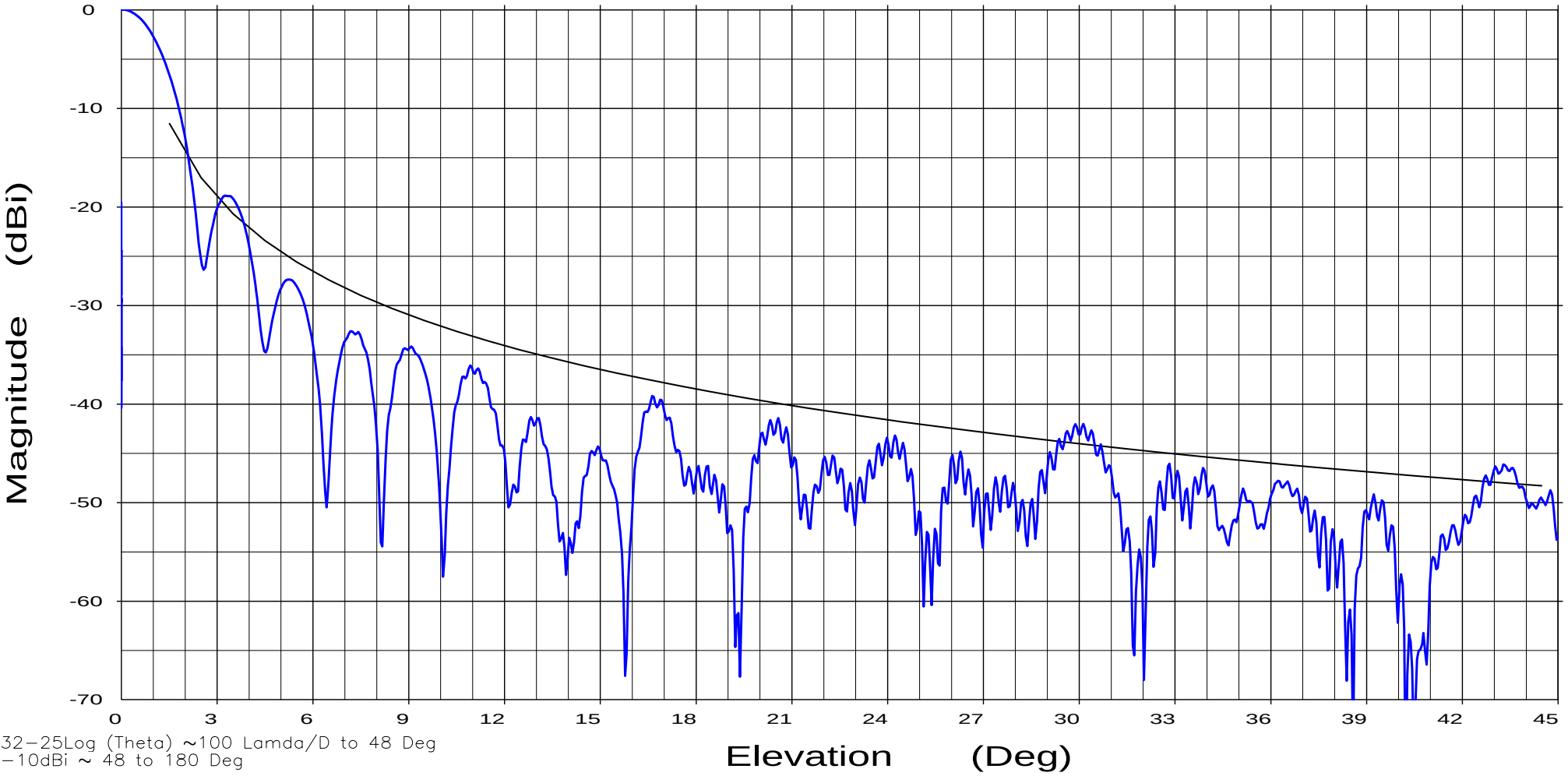
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-11.dat-ant_under_test	1458-11.dat	dBi	0.00	0.04

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.250 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz Rx pol: Horz



32-25Log (Theta) ~100 Lamda/D to 48 Deg
-10dBi ~ 48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-11.dat-ant_under_test	1458-11.dat	dBi	-0.01	0.04

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
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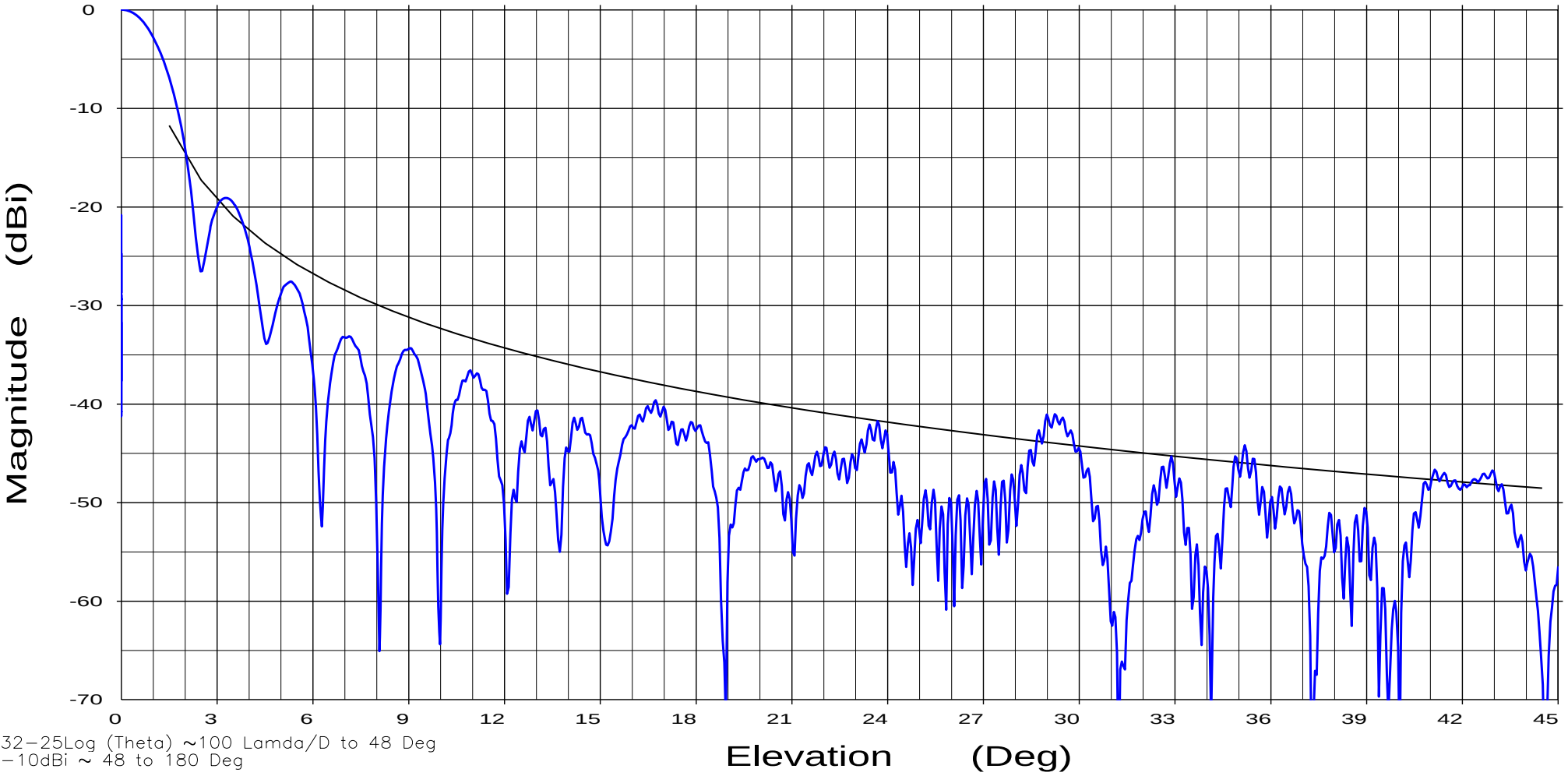
Frequency : 14.500 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz Rx pol: Horz



32-25Log (Theta) ~100 Lamda/D to 48 Deg
-10dBi ~ 48 to 180 Deg

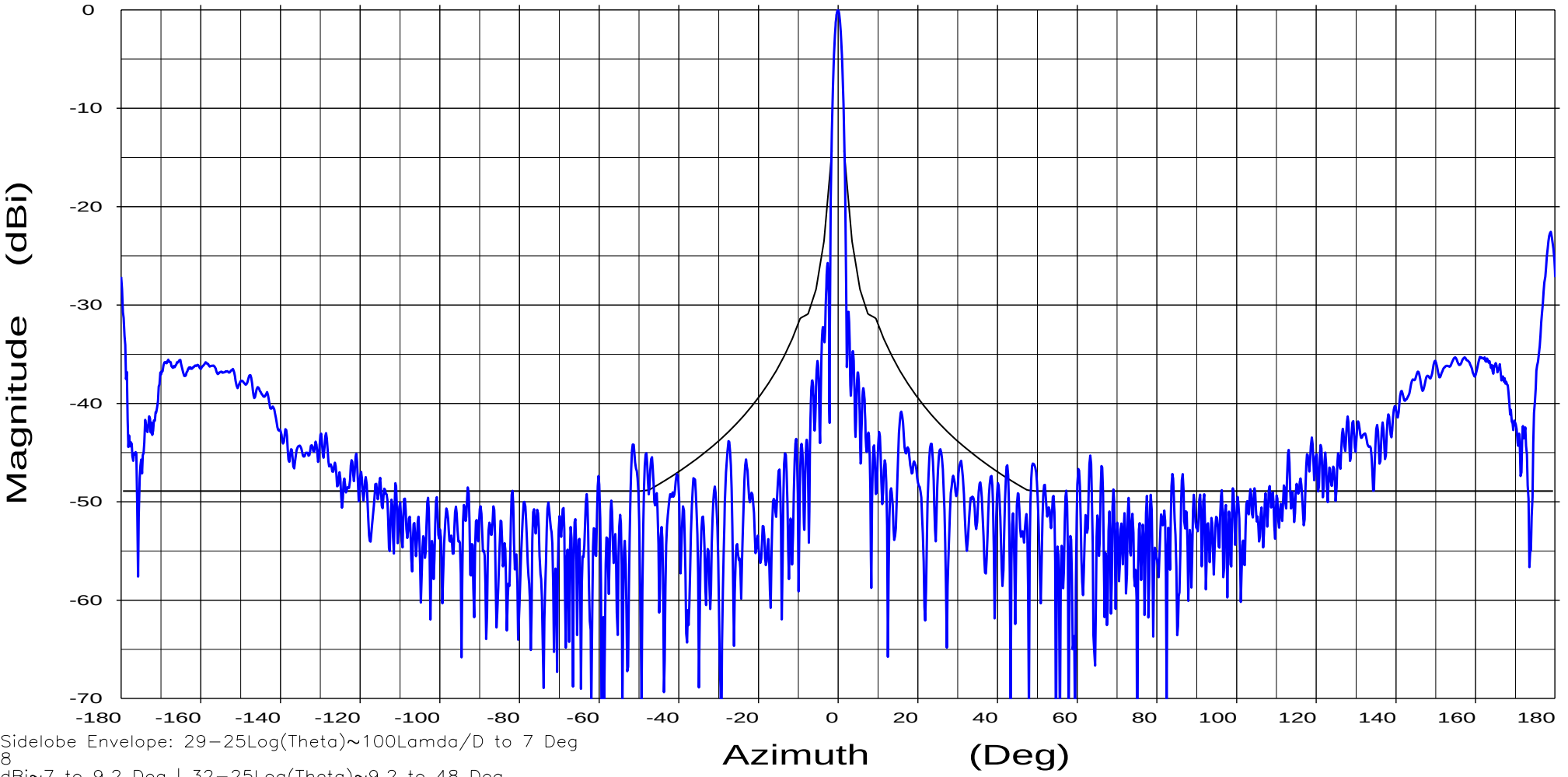
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-11.dat-ant_under_test	1458-11.dat	dBi	-0.00	0.03

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.000 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz. Rx pol: Horz.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-10.dat-ant_under_test	1458-10.dat	dBi	-0.04	-0.01

Prodelin Corporation
East Maiden Test Range
Maiden NC

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Frequency : 14.250 GHz

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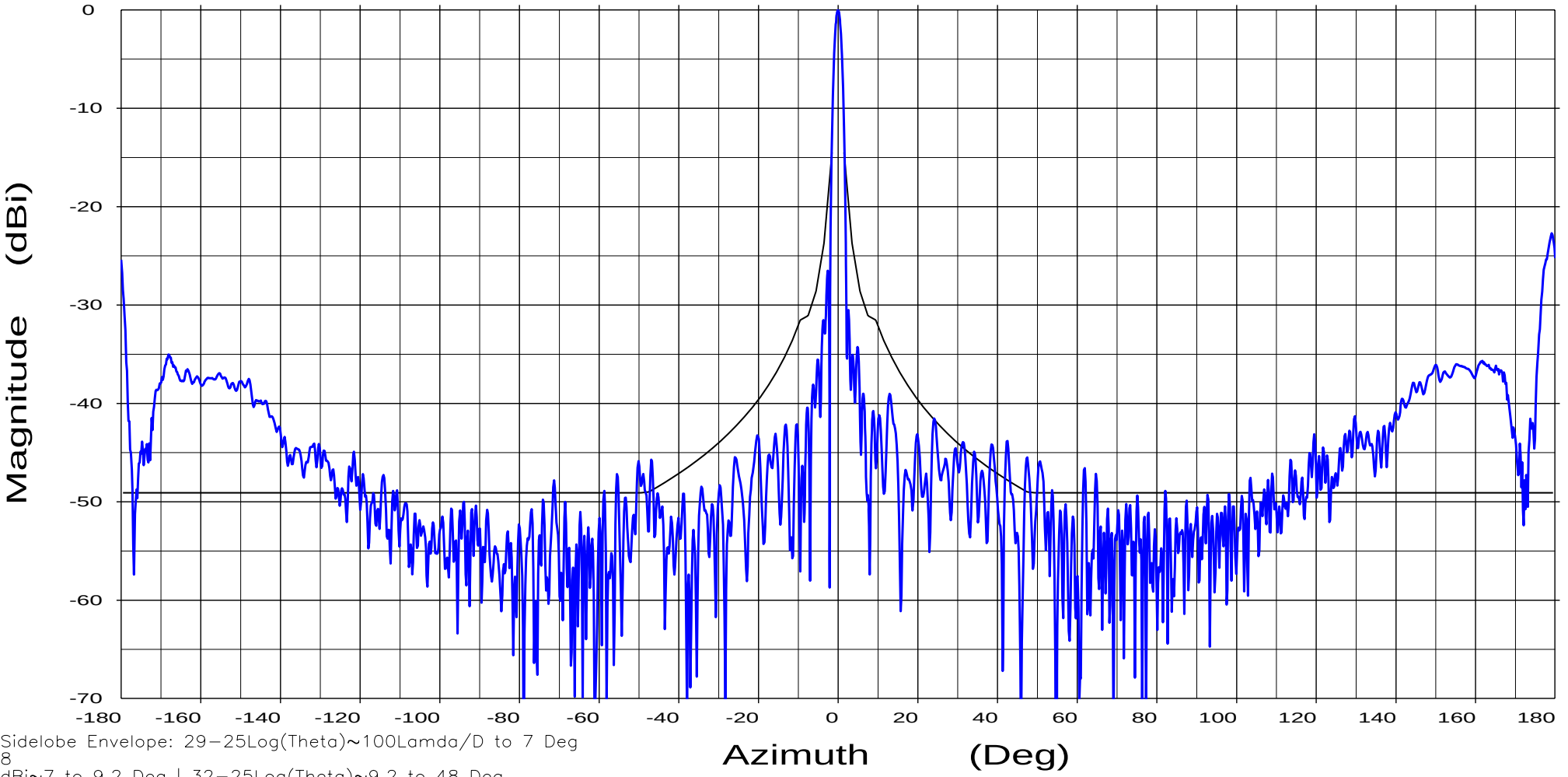
Channel: ch1 Tx pol: Horz. Rx pol: Horz.



Sidelobe Envelope: 29-25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg

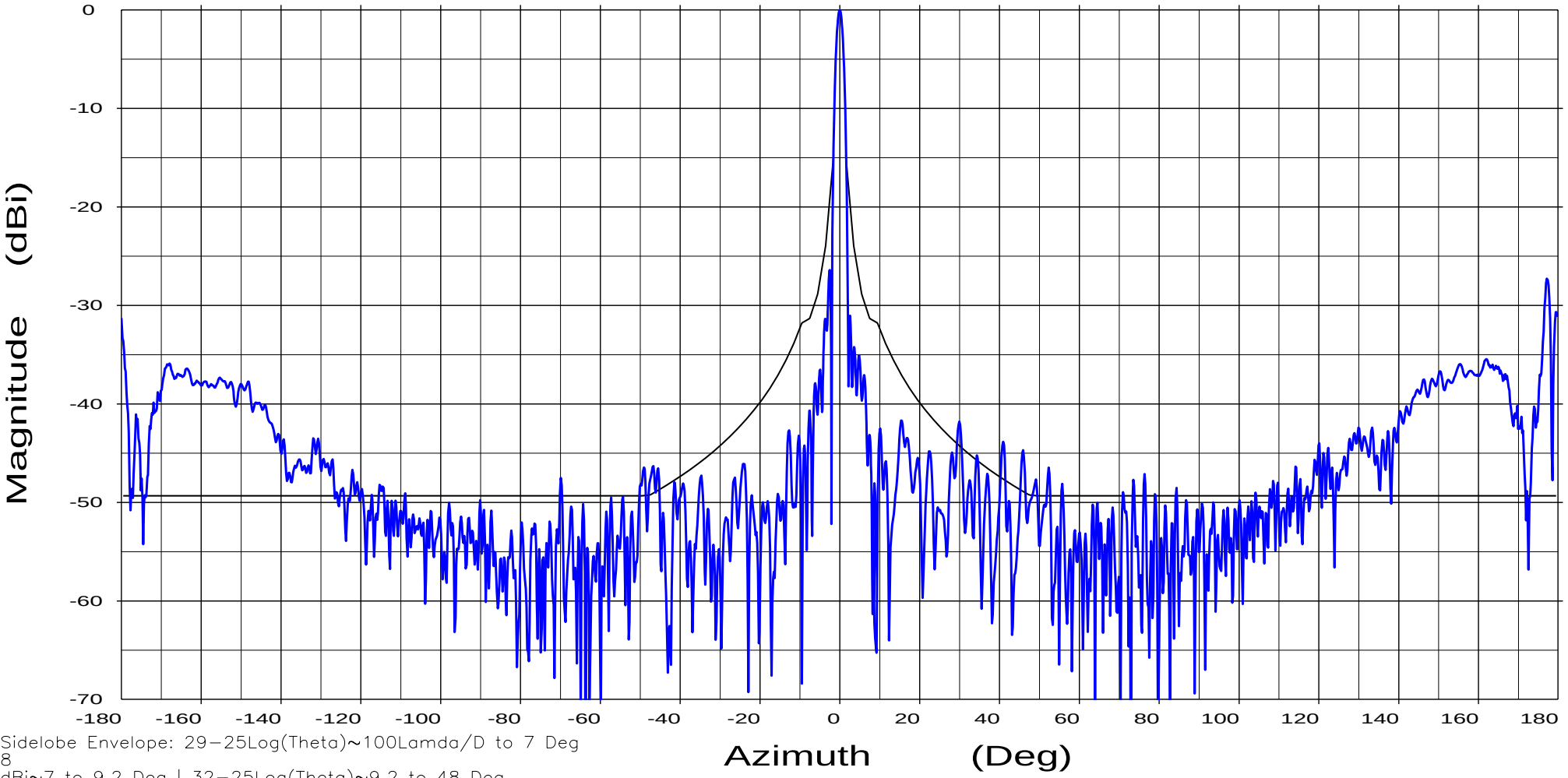
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-10.dat-ant_under_test	1458-10.dat	dBi	-0.02	-0.01

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 14.500 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz. Rx pol: Horz.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-10.dat-ant_under_test	1458-10.dat	dBi	-0.01	-0.03

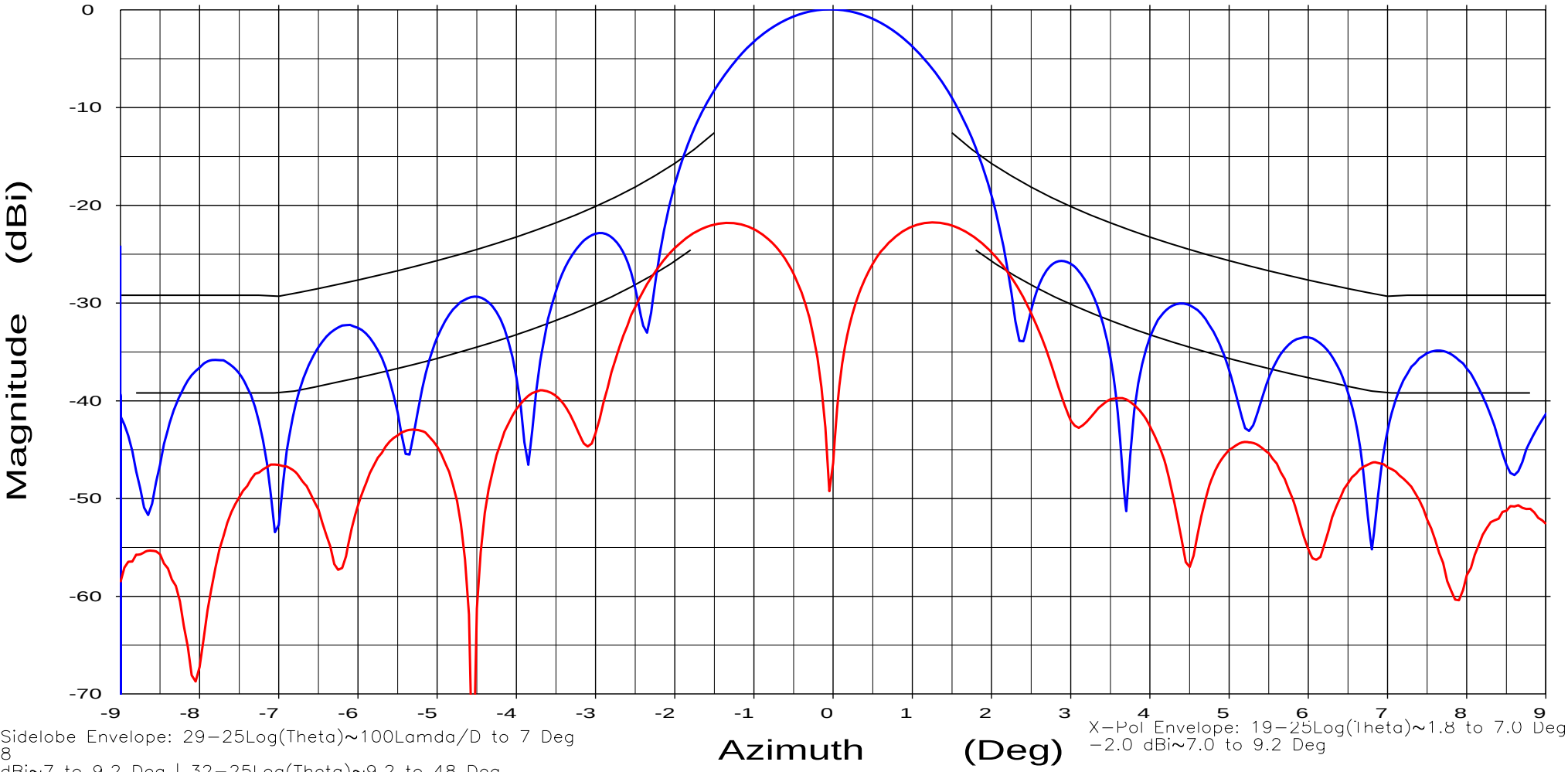
Prodelin Corporation
East Maiden Test Range
Maiden NC

Section IV

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.700 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29-25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg

X-Pol Envelope: 19-25Log(Theta)~1.8 to 7.0 Deg
-2.0 dBi~7.0 to 9.2 Deg

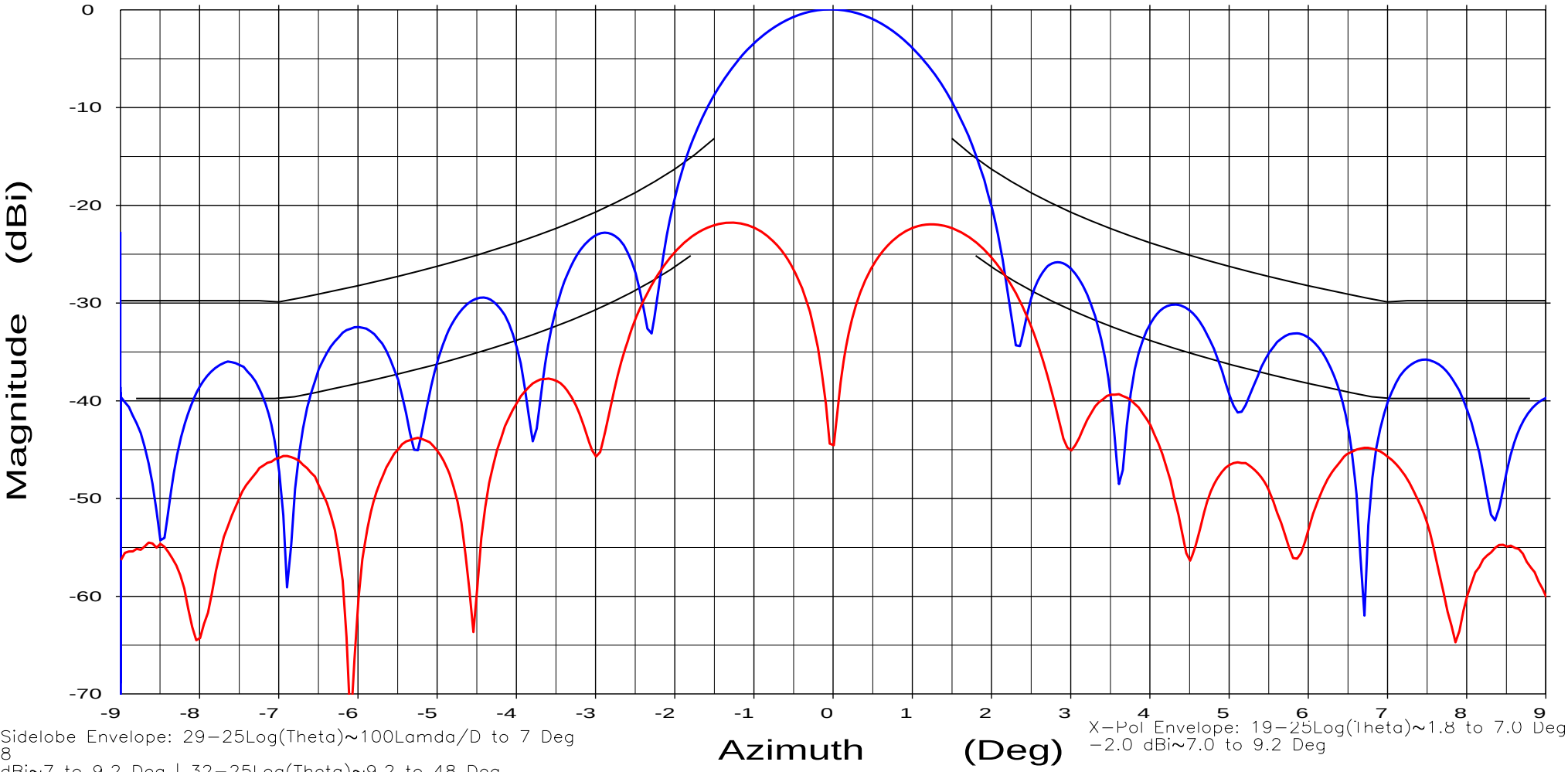
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-17.dat-ant_under_test	1458-17.dat	dBi	-0.04	0.04
1458/65-21.dat-ant_under_test	1458-21.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.950 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29-25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg

X-Pol Envelope: 19-25Log(Theta)~1.8 to 7.0 Deg
-2.0 dBi~7.0 to 9.2 Deg

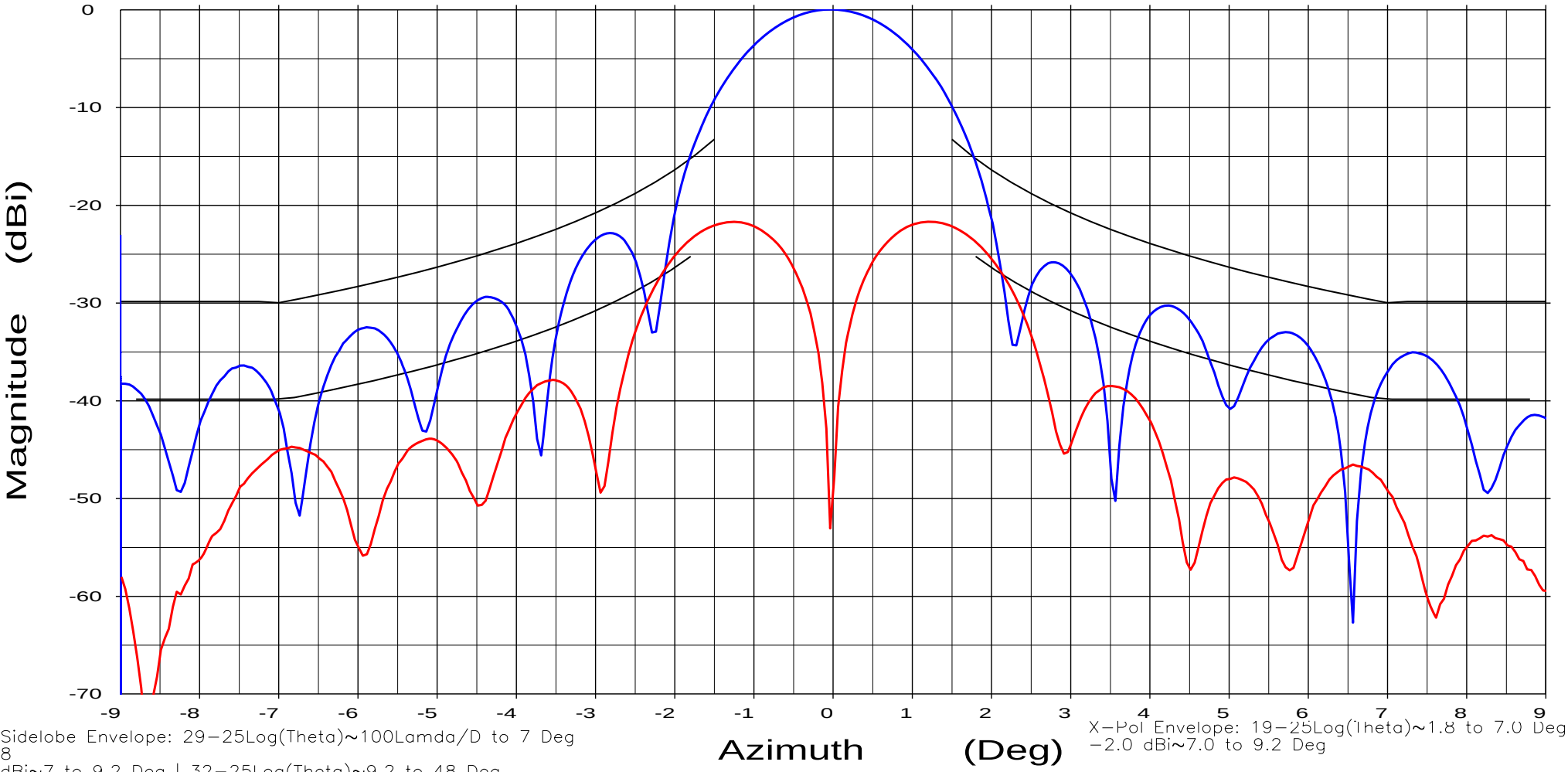
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-17.dat-ant_under_test	1458-17.dat	dBi	-0.03	0.04
1458/65-21.dat-ant_under_test	1458-21.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 12.200 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29-25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg

X-Pol Envelope: 19-25Log(Theta)~1.8 to 7.0 Deg
-2.0 dBi~7.0 to 9.2 Deg

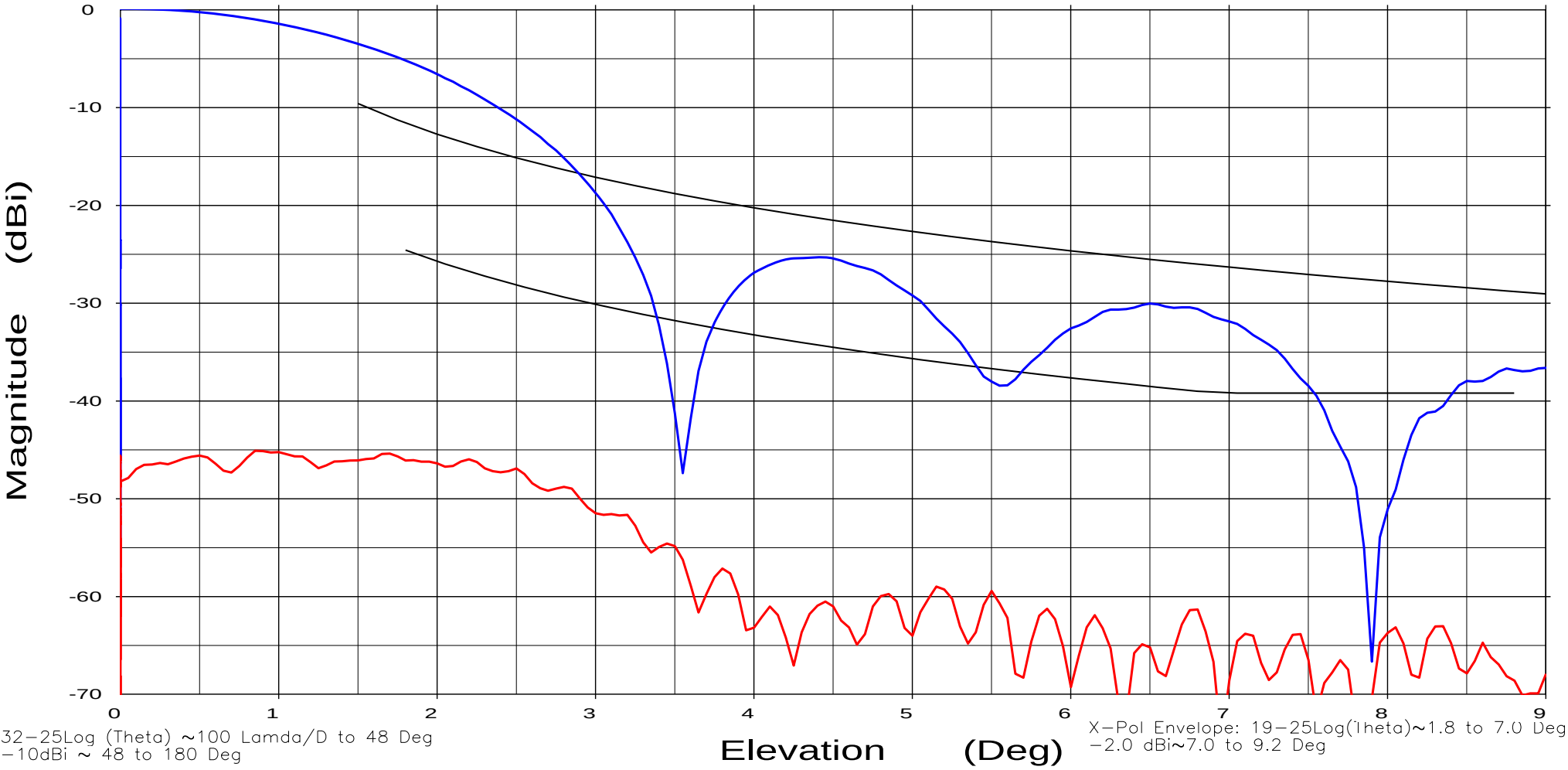
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-17.dat-ant_under_test	1458-17.dat	dBi	-0.03	0.03
1458/65-21.dat-ant_under_test	1458-21.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.700 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



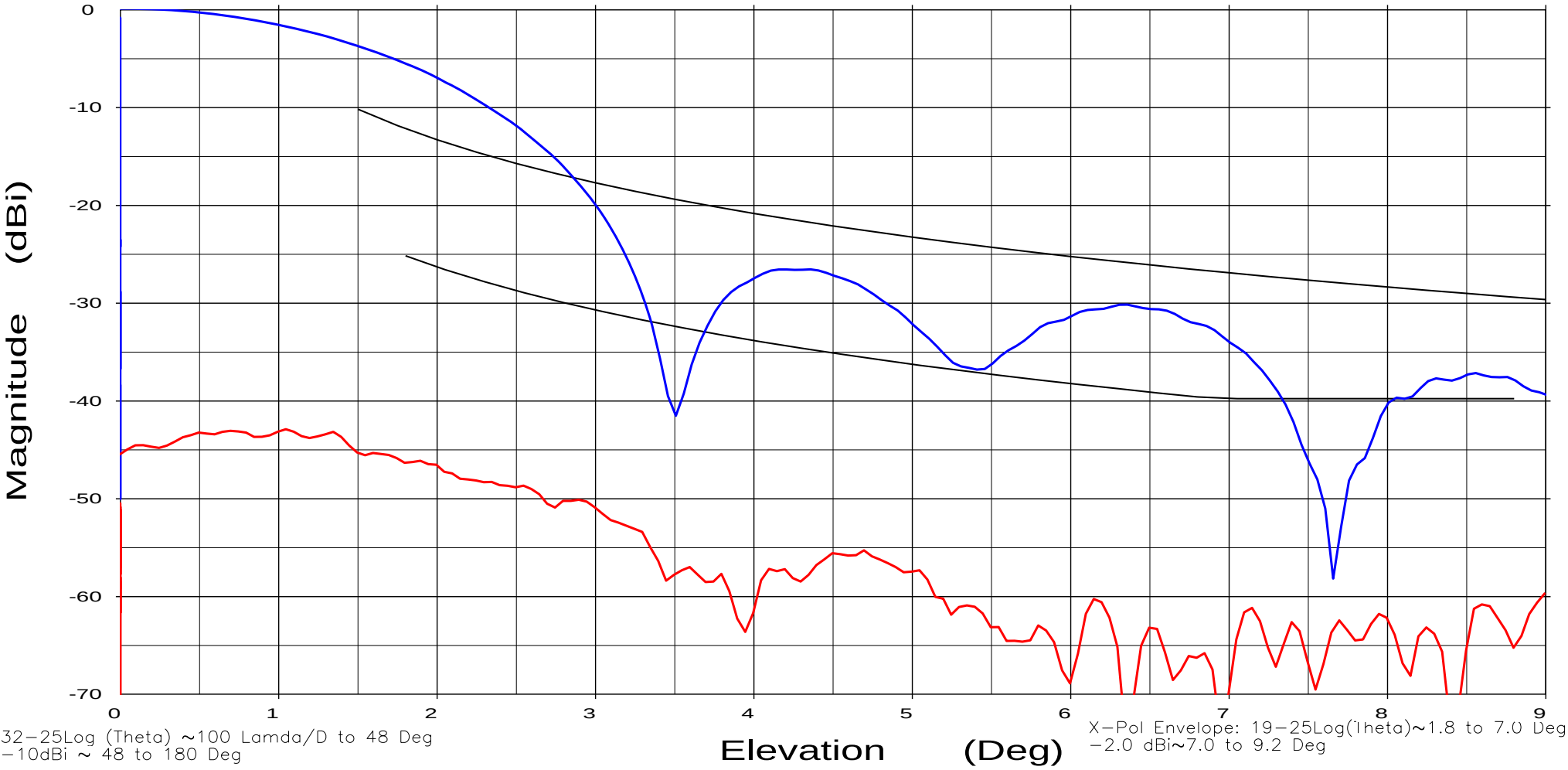
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-18.dat-ant_under_test	1458-18.dat	dBi	0.00	0.12
1458/65-22.dat-ant_under_test	1458-22.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.950 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



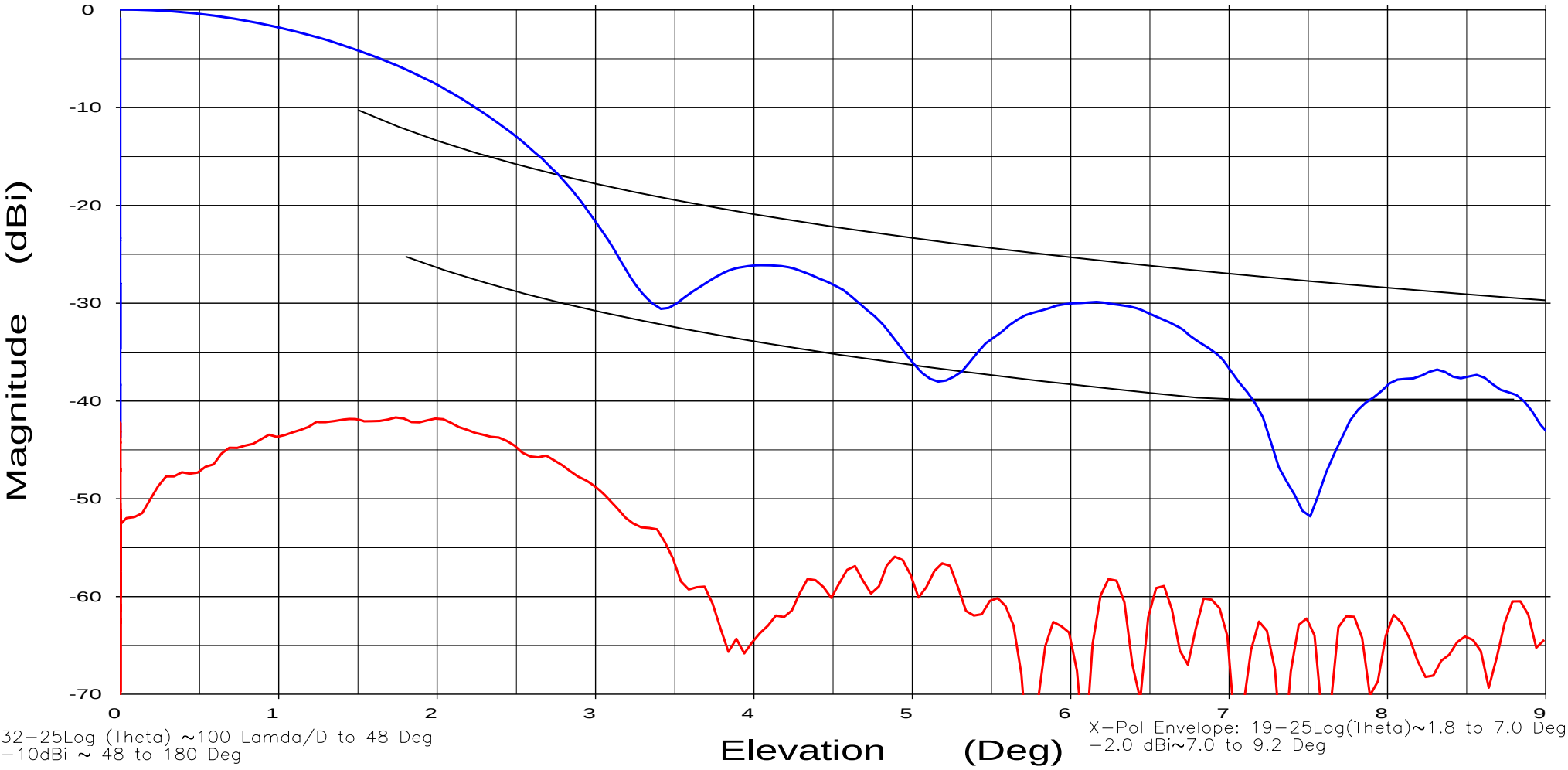
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-18.dat-ant_under_test	1458-18.dat	dBi	-0.02	0.13
1458/65-22.dat-ant_under_test	1458-22.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 12.200 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



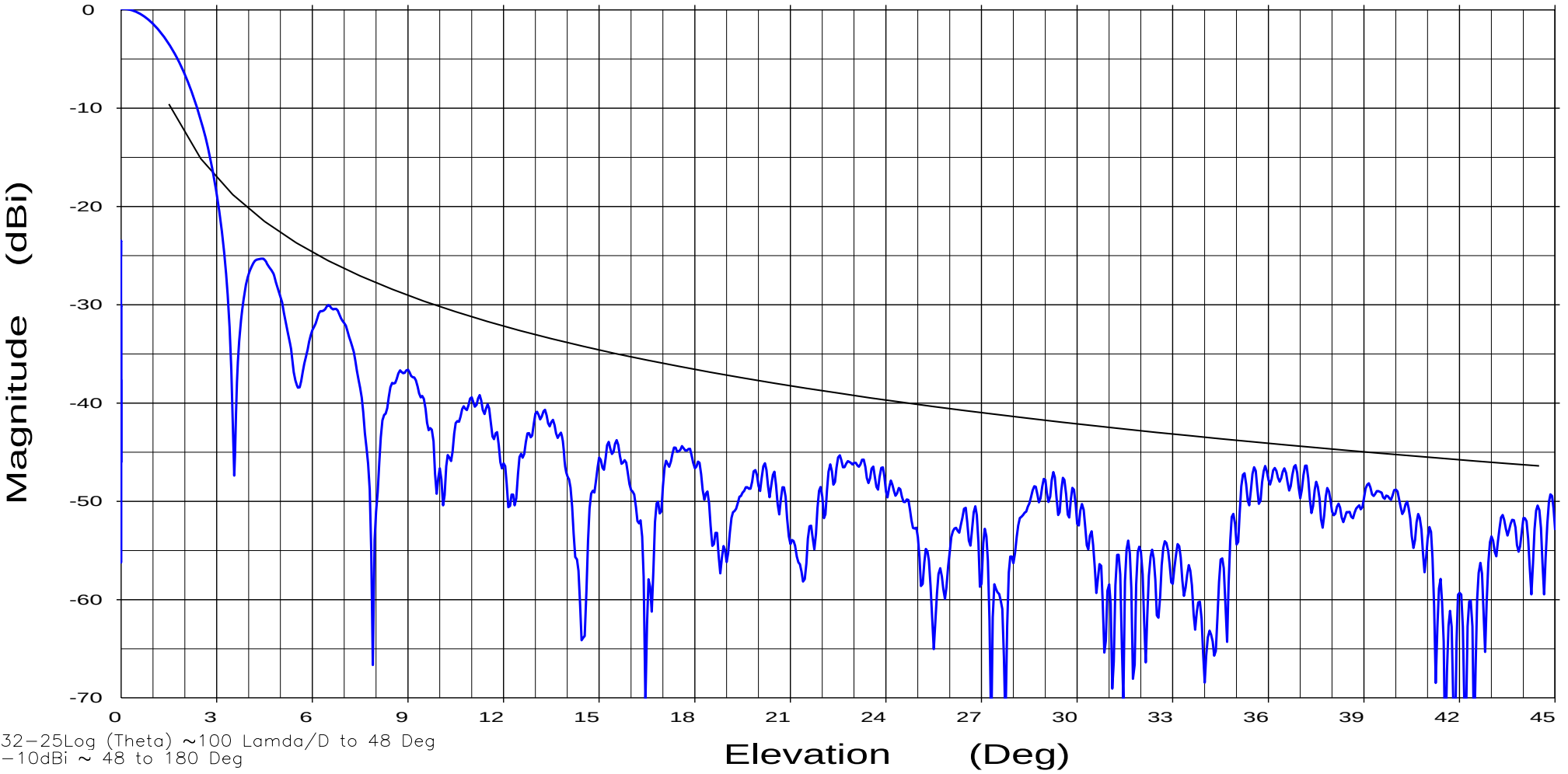
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-18.dat-ant_under_test	1458-18.dat	dBi	-0.05	0.06
1458/65-22.dat-ant_under_test	1458-22.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.700 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



32-25Log (Theta) ~100 Lamda/D to 48 Deg
-10dBi ~ 48 to 180 Deg

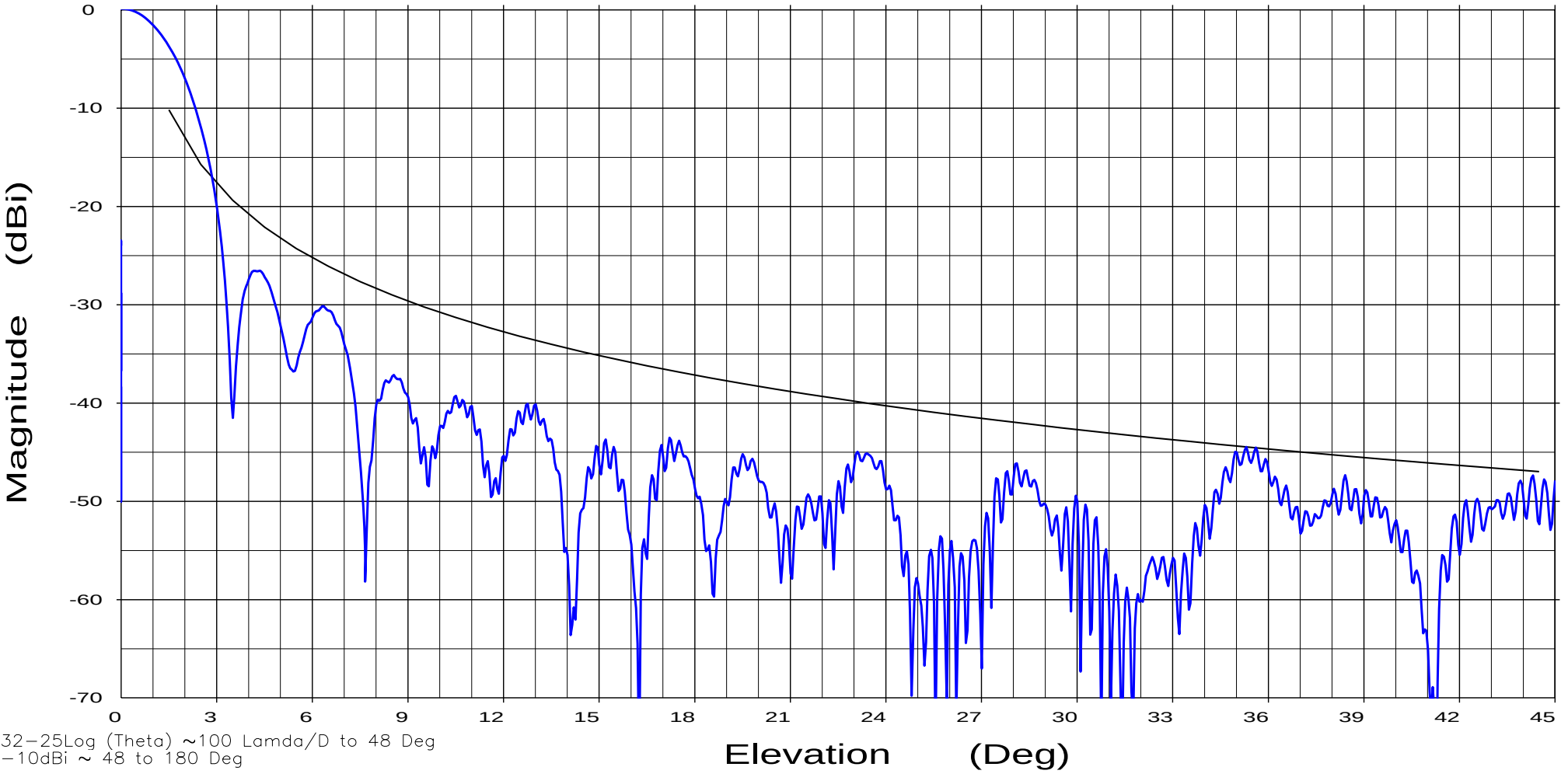
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-18.dat-ant_under_test	1458-18.dat	dBi	0.00	0.12

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.950 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



32-25Log (Theta) ~100 Lamda/D to 48 Deg
-10dBi ~ 48 to 180 Deg

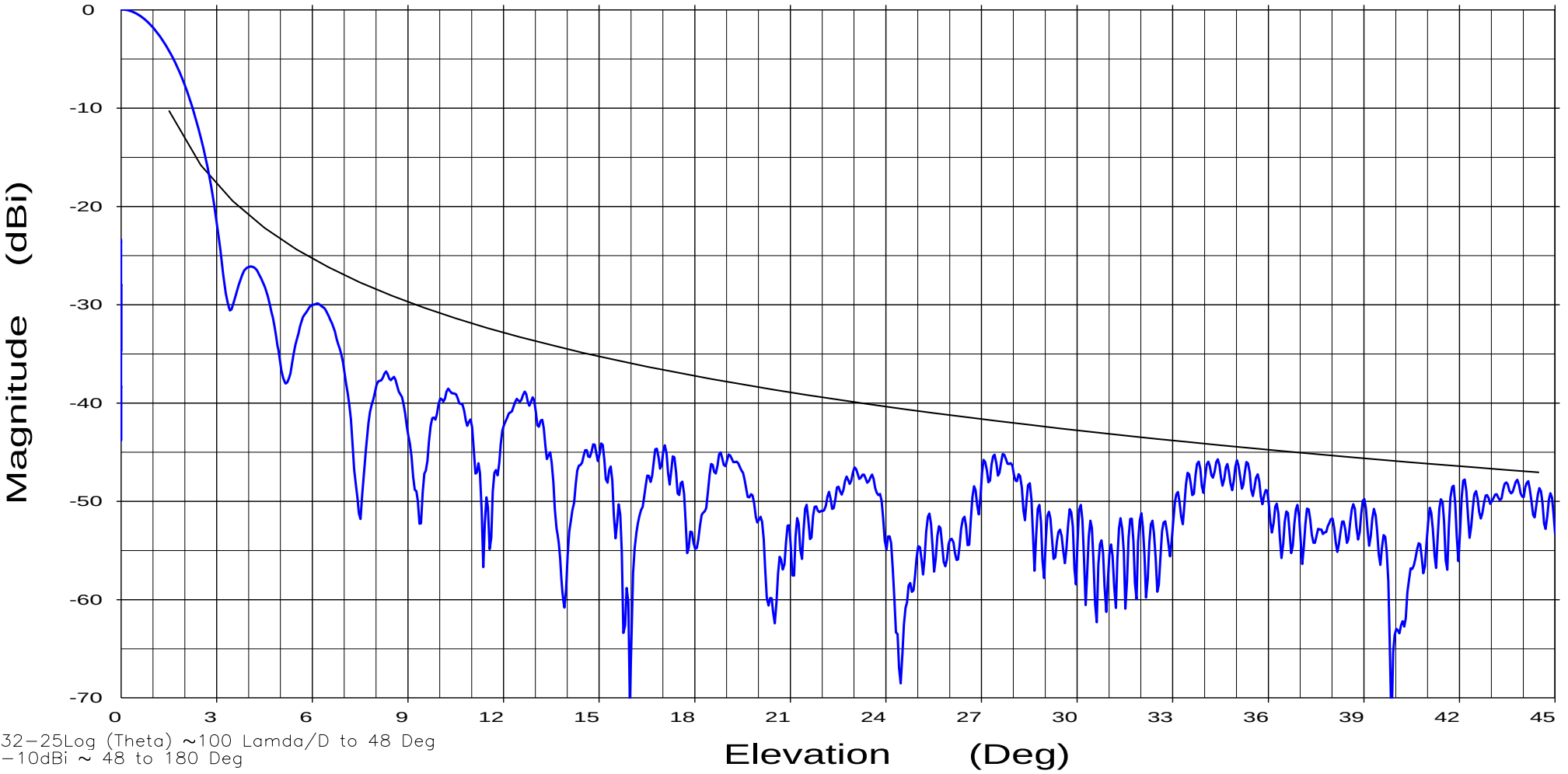
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-18.dat-ant_under_test	1458-18.dat	dBi	-0.02	0.13

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 12.200 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



32-25Log (Theta) ~100 Lamda/D to 48 Deg
-10dBi ~ 48 to 180 Deg

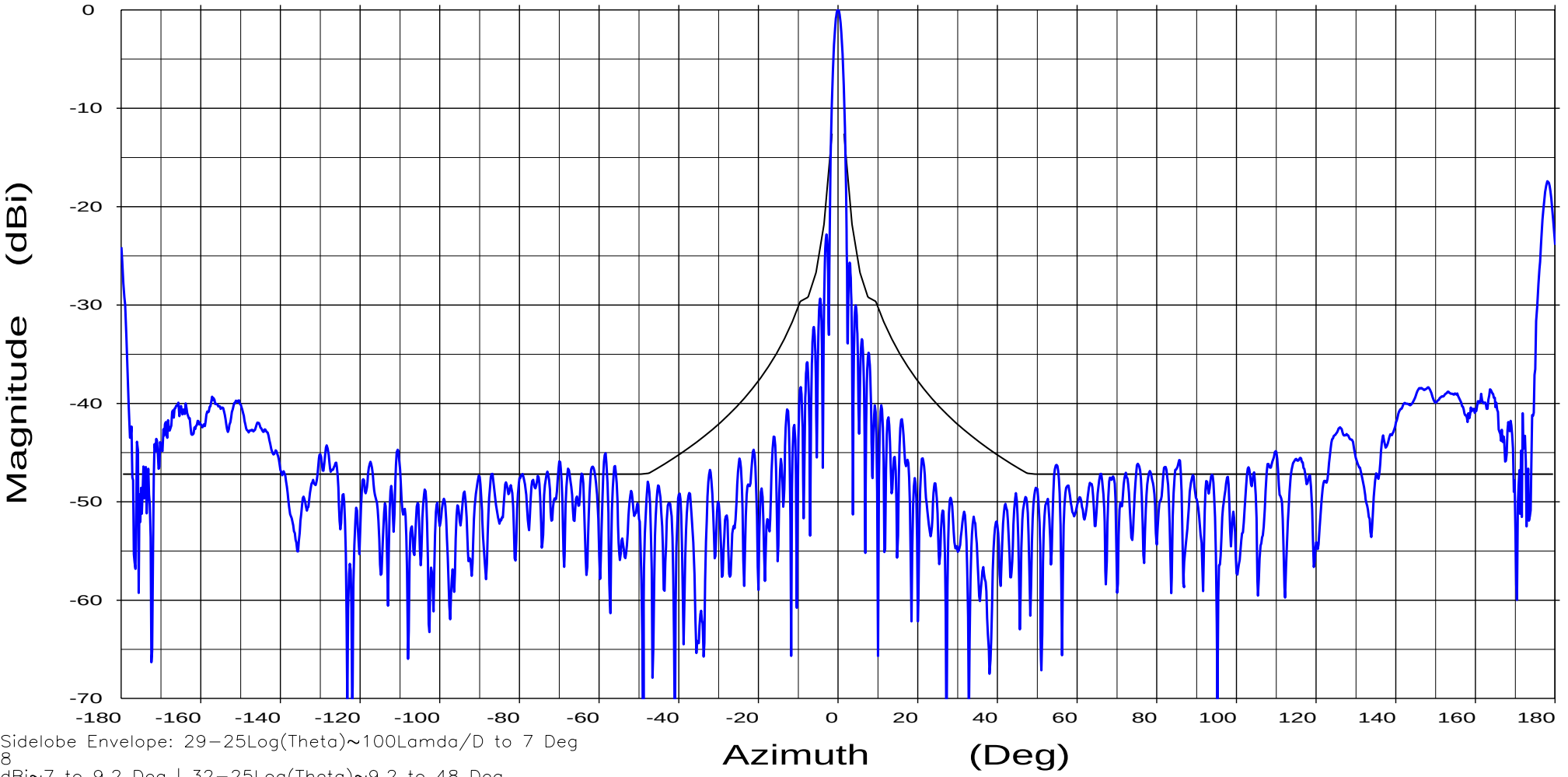
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-18.dat-ant_under_test	1458-18.dat	dBi	-0.05	0.06

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.700 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg

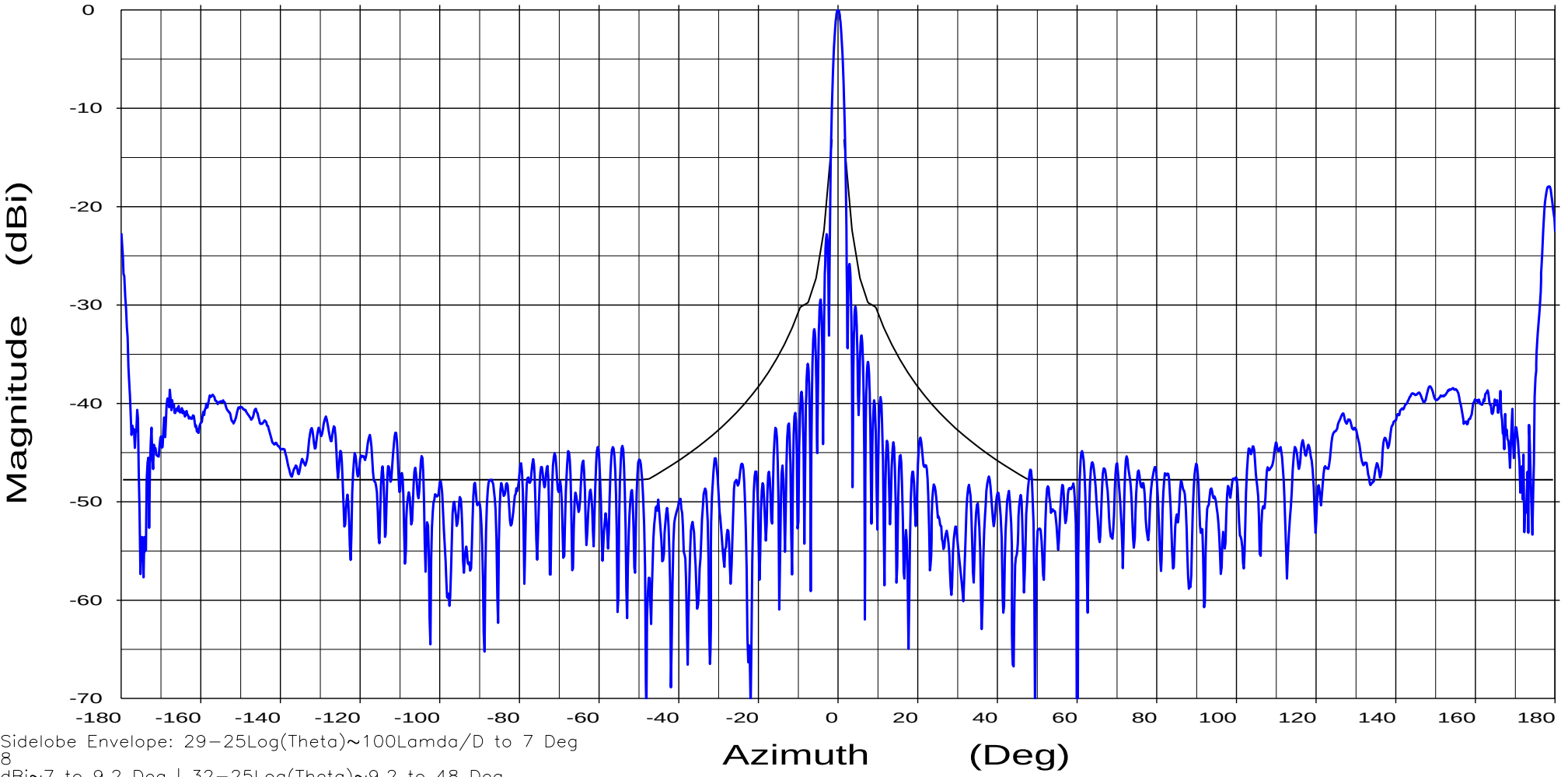
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-17.dat-ant_under_test	1458-17.dat	dBi	-0.04	0.04

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.950 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg

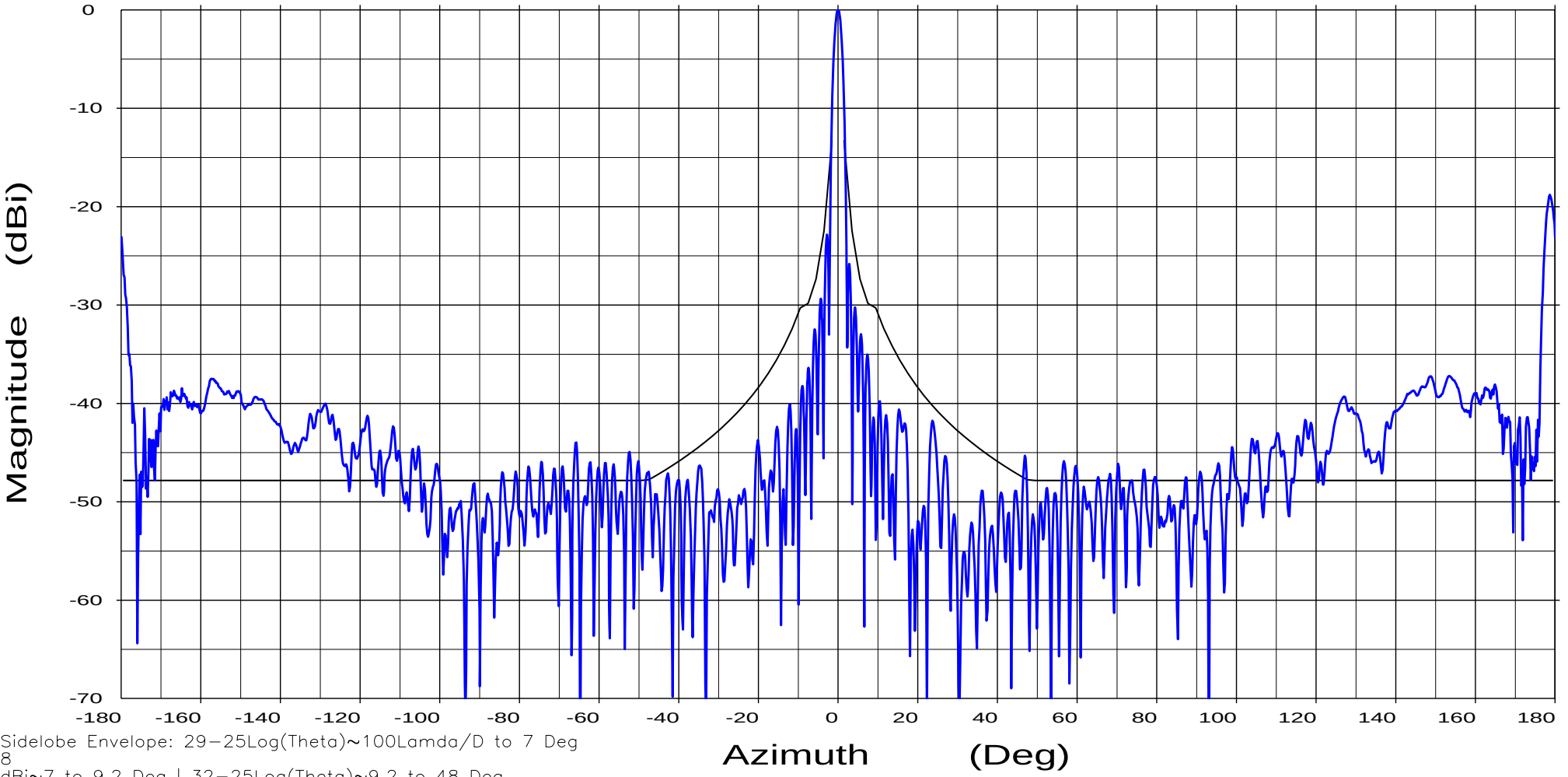
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-17.dat-ant_under_test	1458-17.dat	dBi	-0.03	0.04

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 12.200 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-17.dat-ant_under_test	1458-17.dat	dBi	-0.03	0.03

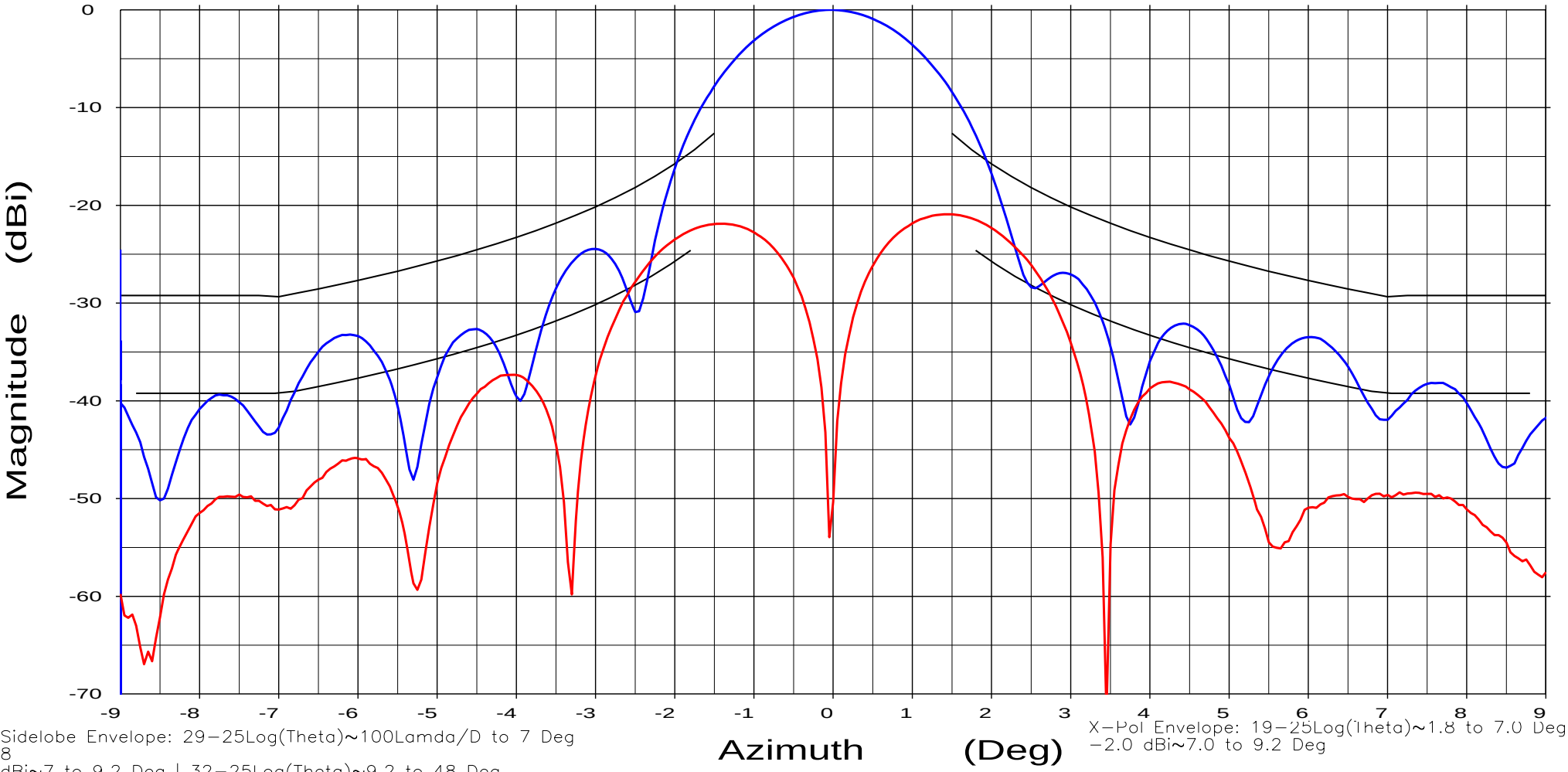
Prodelin Corporation
East Maiden Test Range
Maiden NC

Section V

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.700 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz. Rx pol: Horz.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg

X−Pol Envelope: 19−25Log(Theta)~1.8 to 7.0 Deg
−2.0 dBi~7.0 to 9.2 Deg

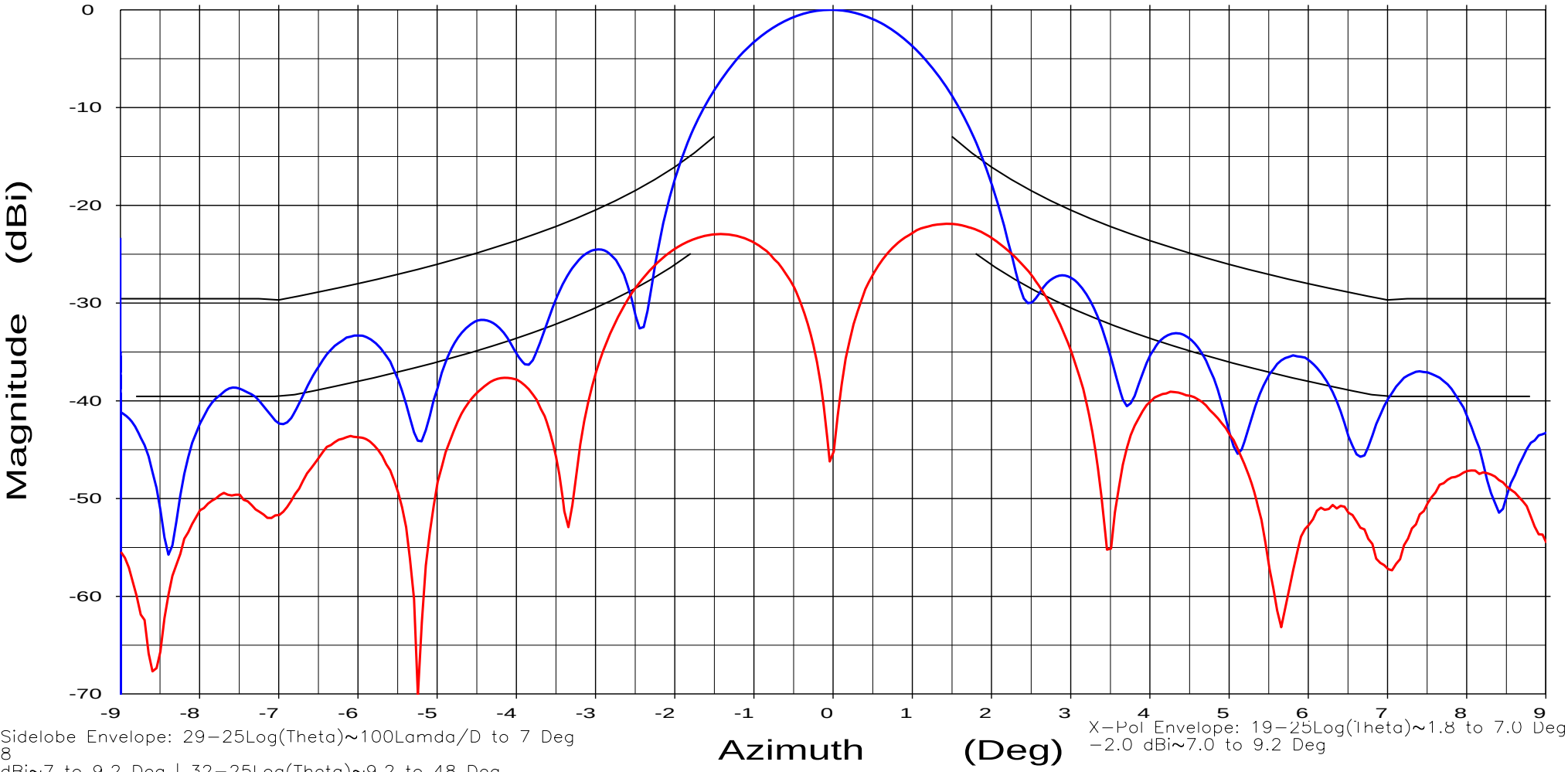
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-10.dat-ant_under_test	1458-10.dat	dBi	-0.03	-0.00
1458/65-14.dat-ant_under_test	1458-14.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.950 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz. Rx pol: Horz.



Sidelobe Envelope: 29-25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg

X-Pol Envelope: 19-25Log(Theta)~1.8 to 7.0 Deg
-2.0 dBi~7.0 to 9.2 Deg

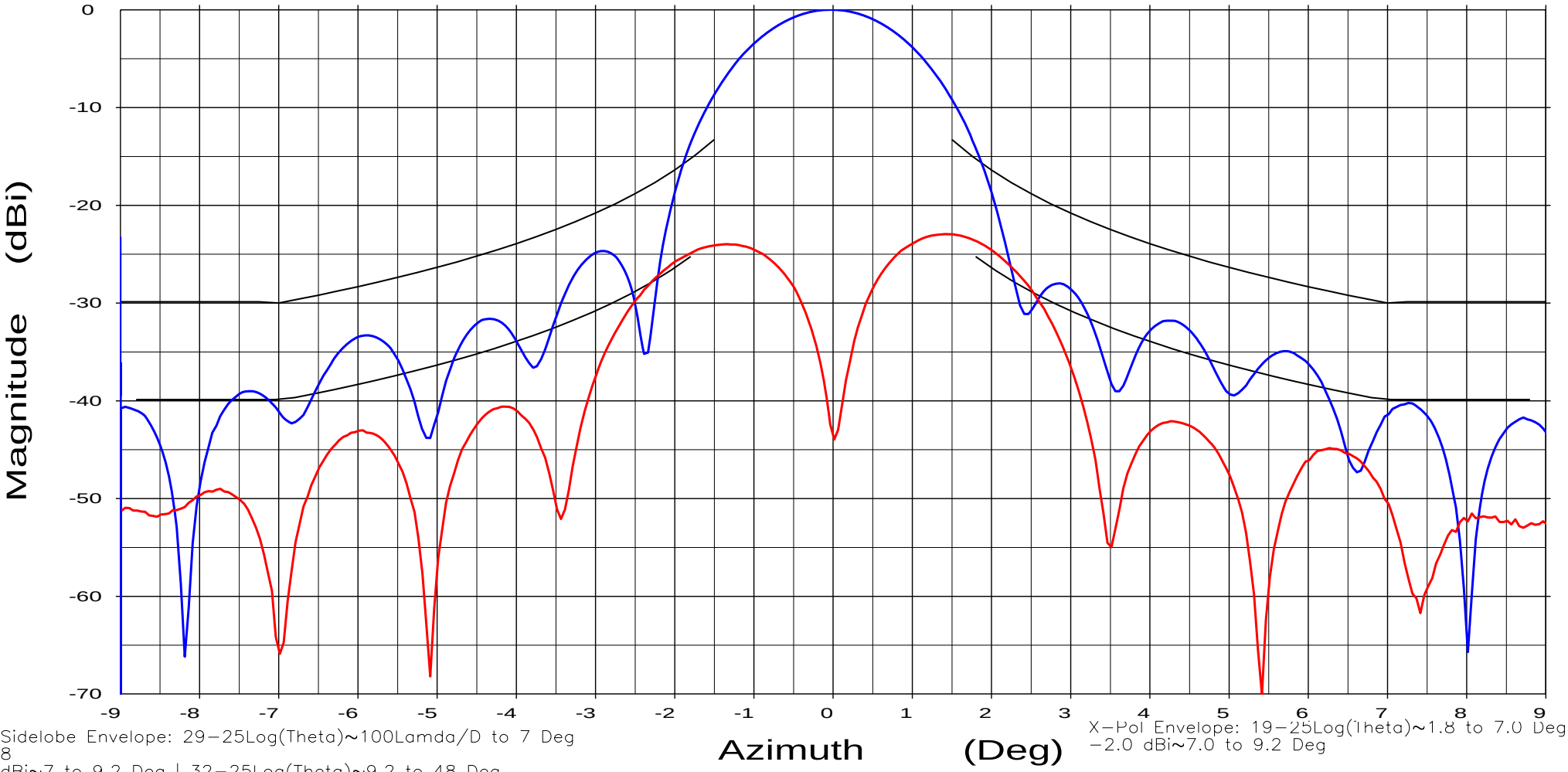
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-10.dat-ant_under_test	1458-10.dat	dBi	-0.03	0.01
1458/65-14.dat-ant_under_test	1458-14.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 12.200 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz. Rx pol: Horz.



Sidelobe Envelope: 29-25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg

X-Pol Envelope: 19-25Log(Theta)~1.8 to 7.0 Deg
-2.0 dBi~7.0 to 9.2 Deg

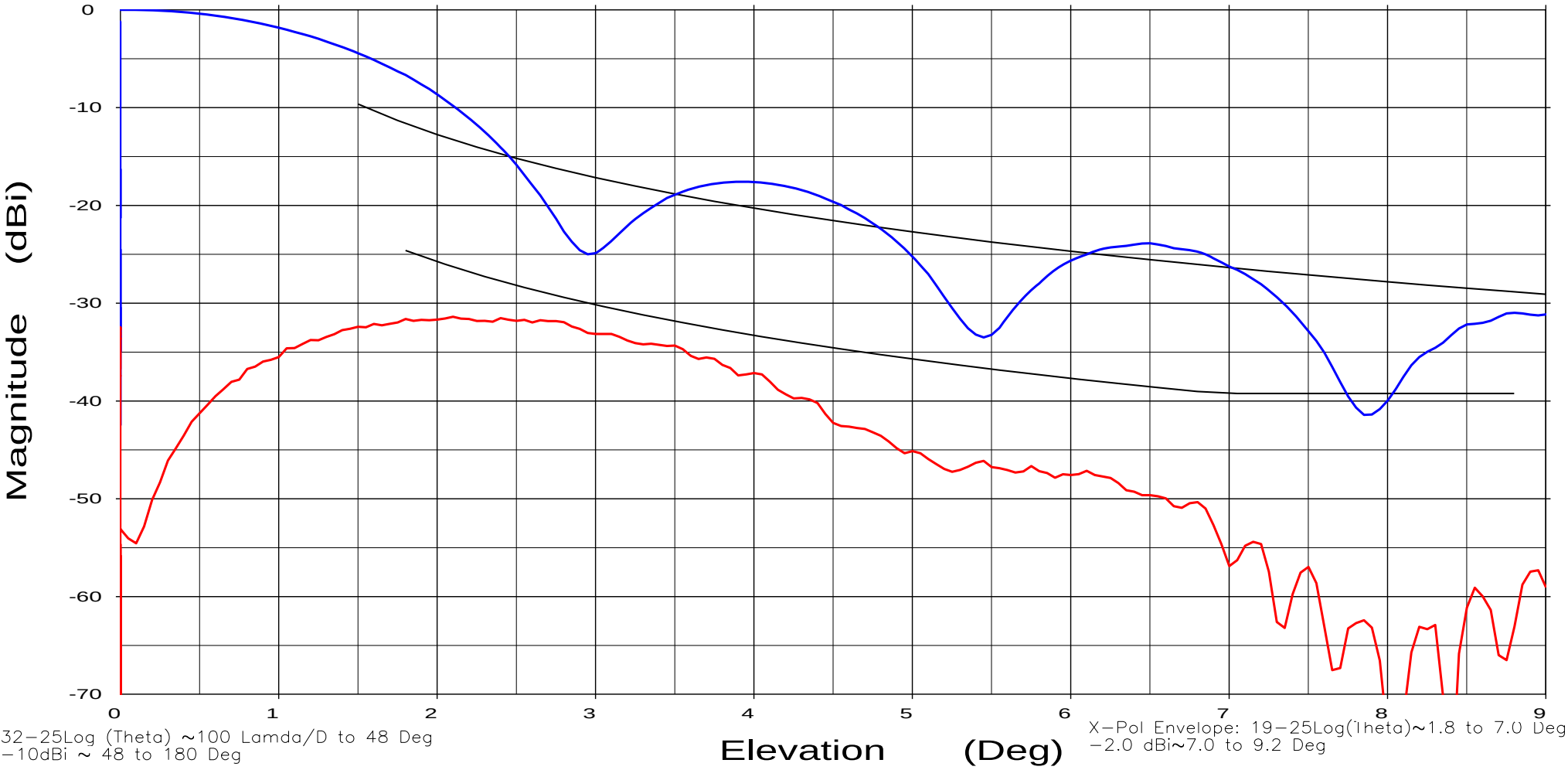
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-10.dat-ant_under_test	1458-10.dat	dBi	-0.03	0.02
1458/65-14.dat-ant_under_test	1458-14.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.700 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz Rx pol: Horz



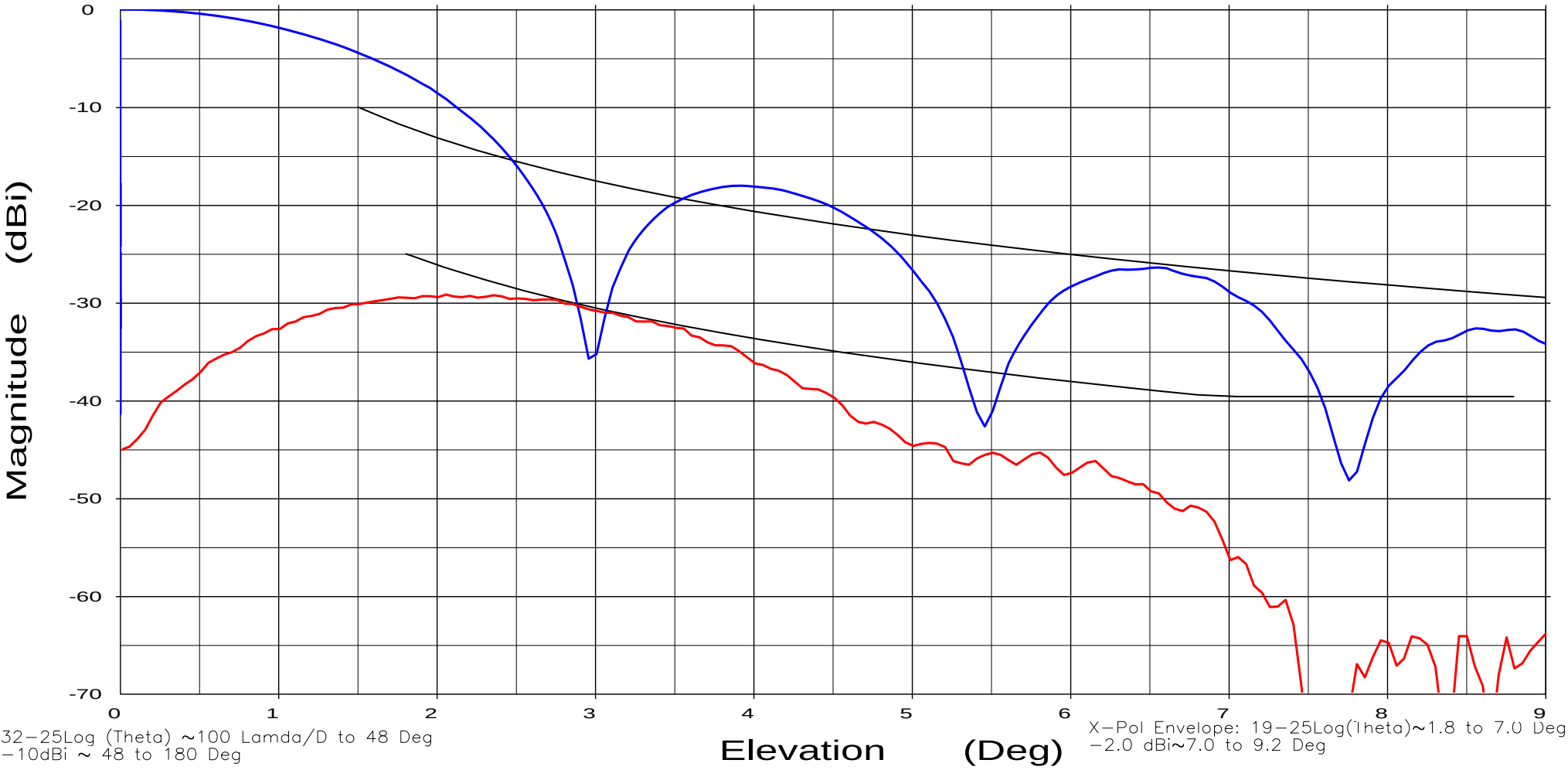
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-11.dat-ant_under_test	1458-11.dat	dBi	0.01	0.01
1458/65-15.dat-ant_under_test	1458-15.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.950 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz Rx pol: Horz



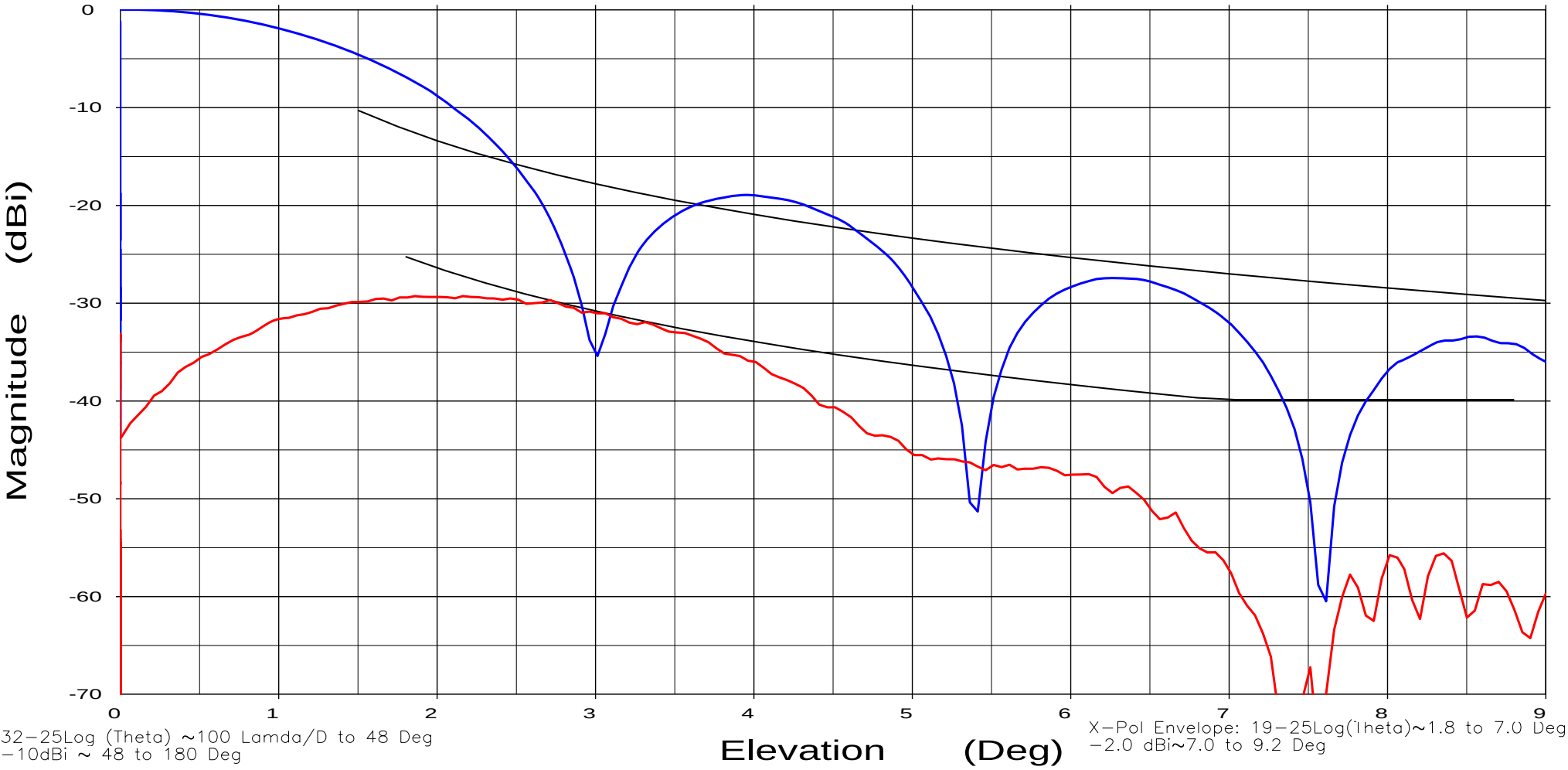
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-11.dat-ant_under_test	1458-11.dat	dBi	0.01	0.03
1458/65-15.dat-ant_under_test	1458-15.dat	dBi		

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 12.200 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz Rx pol: Horz



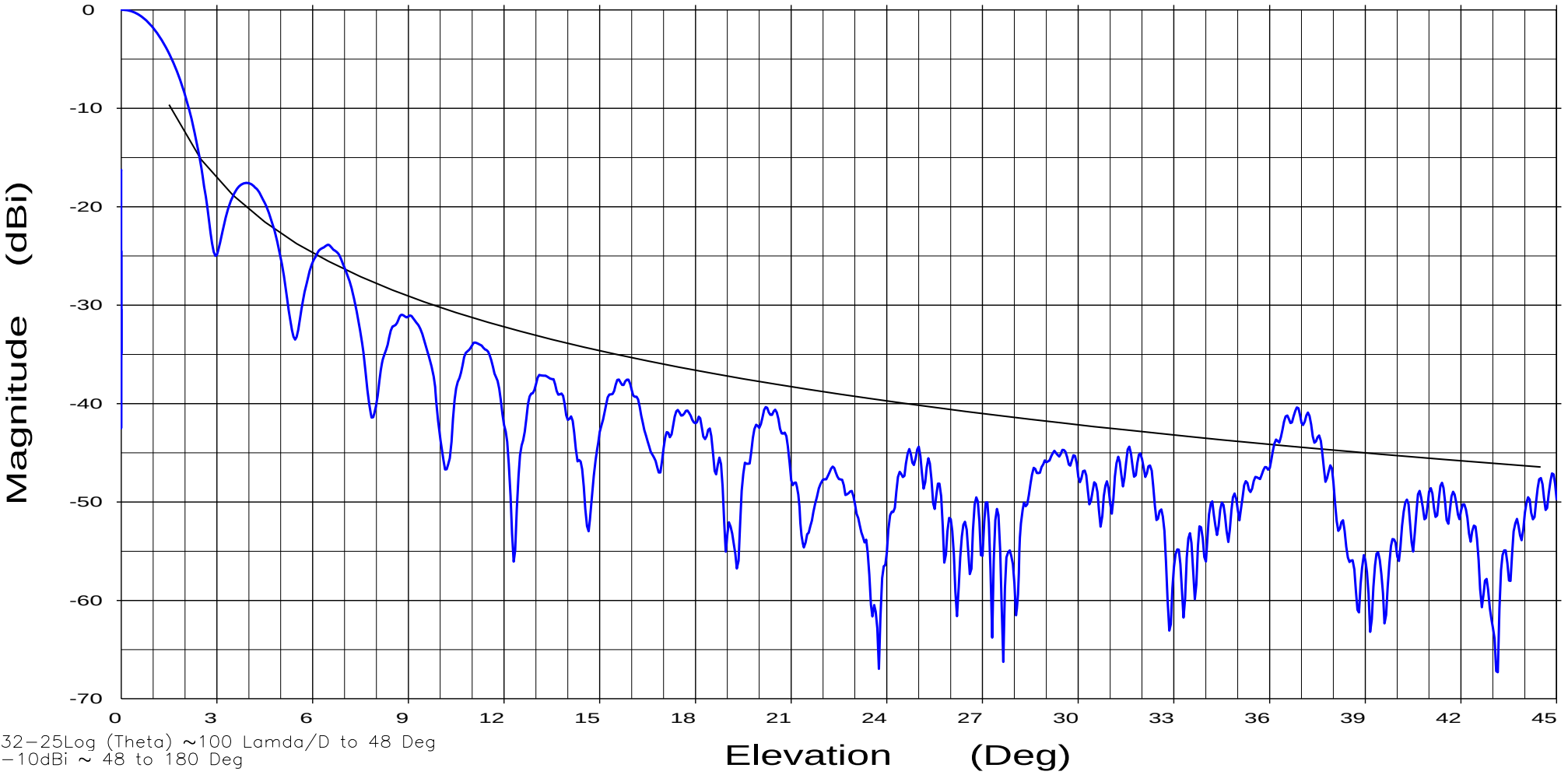
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-11.dat-ant_under_test	1458-11.dat	dBi	0.01	0.03
1458/65-15.dat-ant_under_test	1458-15.dat	dBi	2.14	-29.36

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.700 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz Rx pol: Horz



32-25Log (Theta) ~100 Lamda/D to 48 Deg
-10dBi ~ 48 to 180 Deg

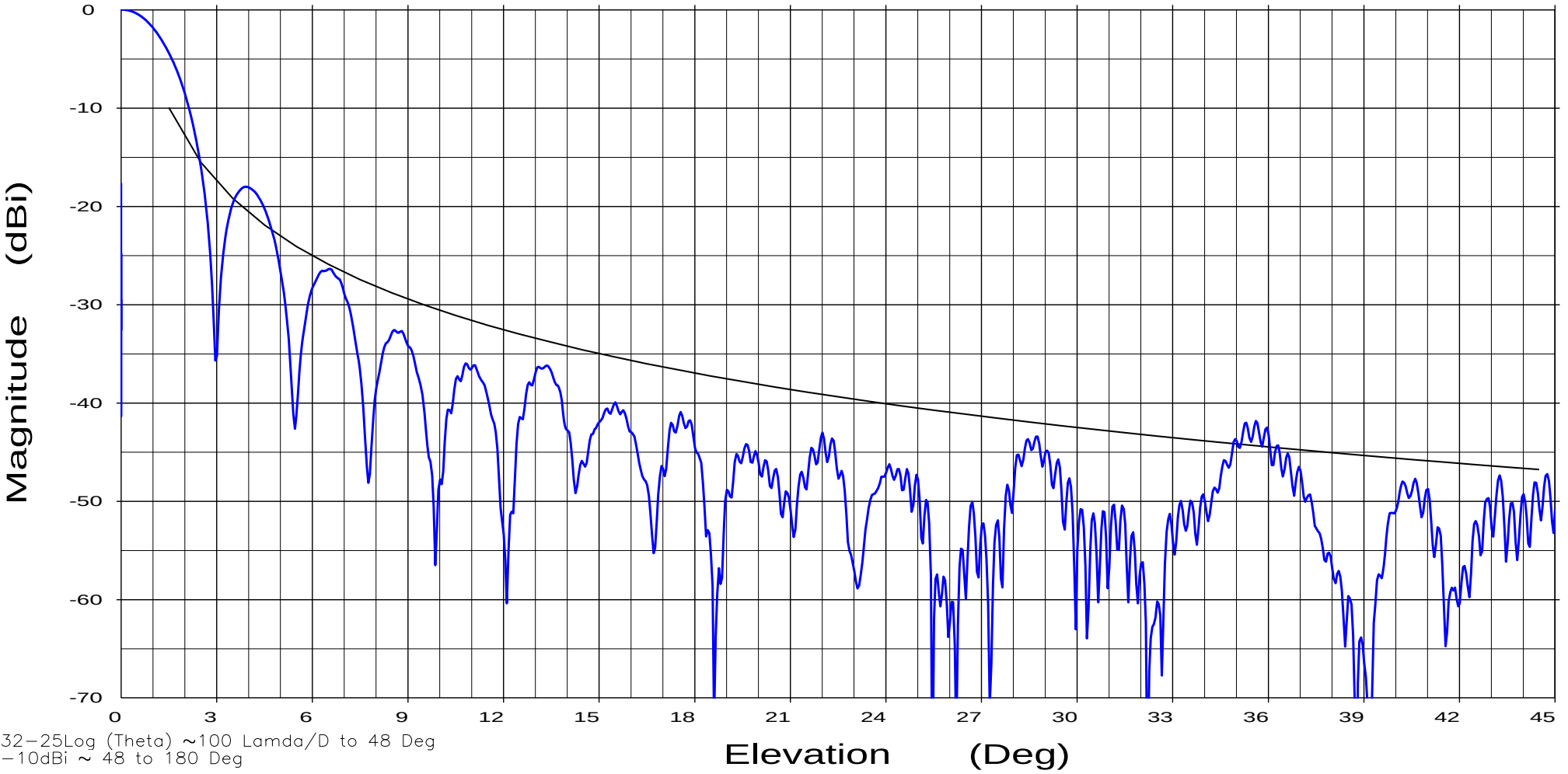
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-11.dat-ant_under_test	1458-11.dat	dBi	0.01	0.01

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.950 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz Rx pol: Horz



32-25Log (Theta) ~100 Lamda/D to 48 Deg
-10dBi ~ 48 to 180 Deg

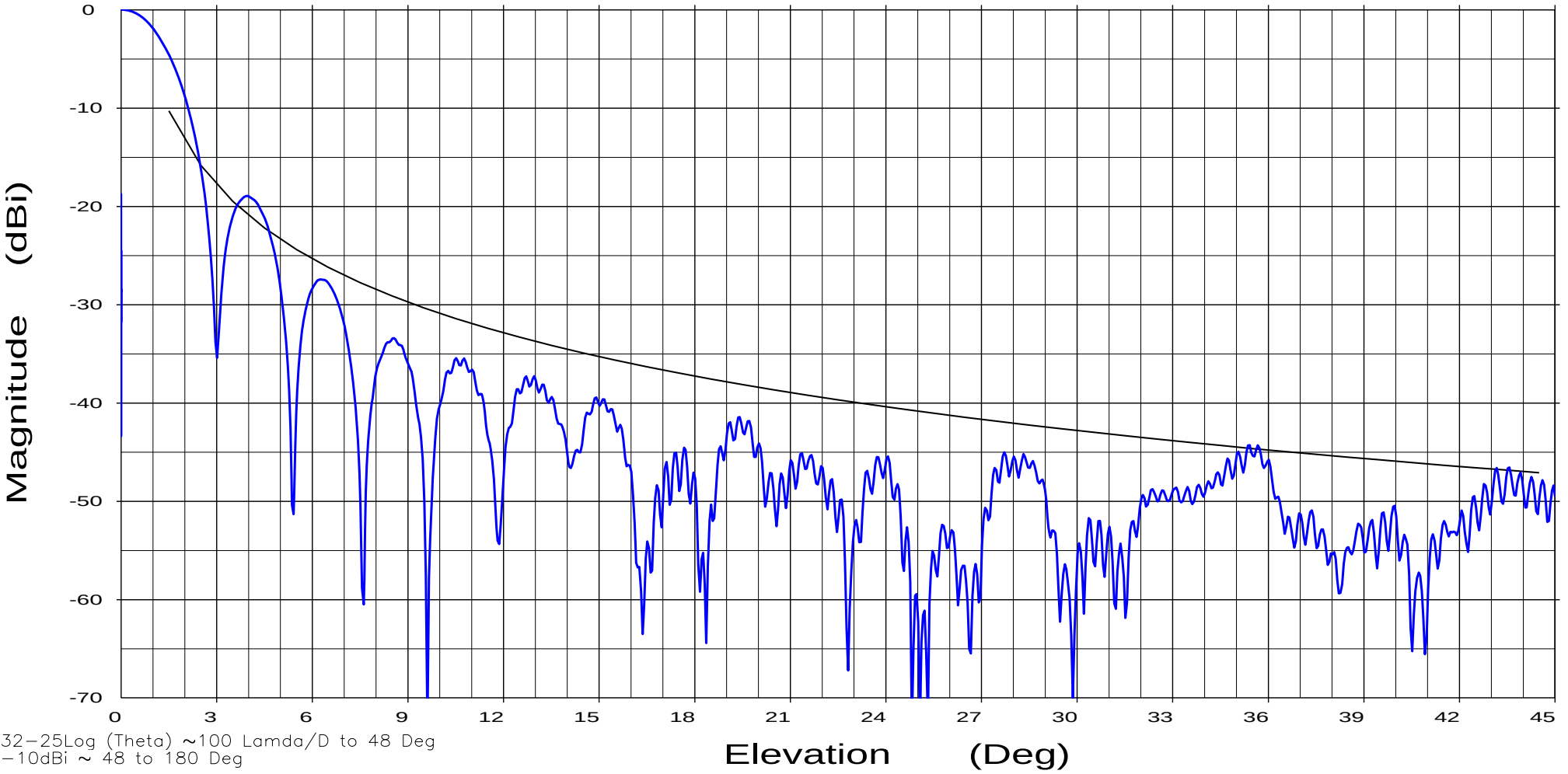
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-11.dat-ant_under_test	1458-11.dat	dBi	0.01	0.03

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 12.200 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz Rx pol: Horz



32-25Log (Theta) ~100 Lamda/D to 48 Deg
-10dBi ~ 48 to 180 Deg

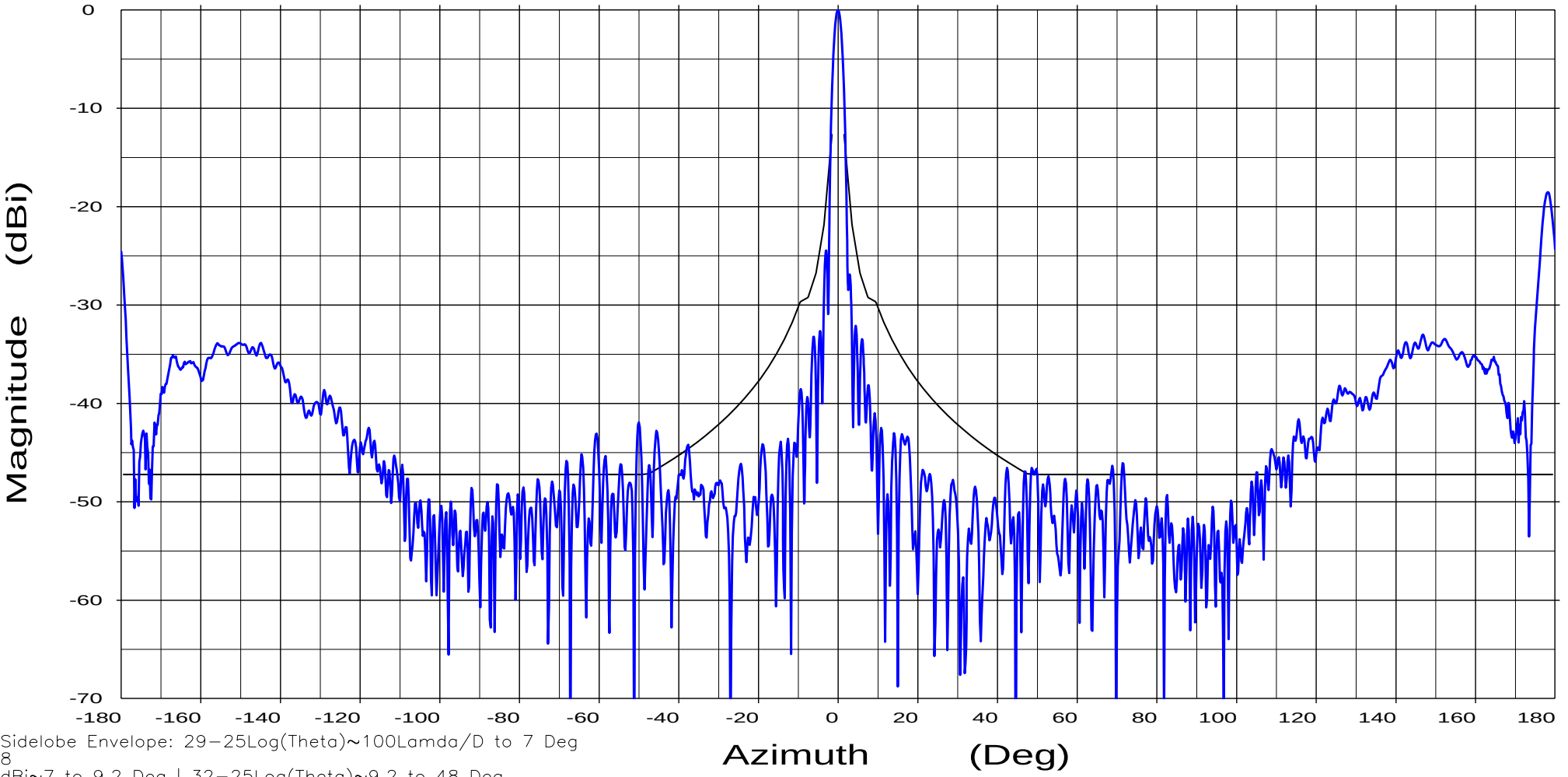
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-11.dat-ant_under_test	1458-11.dat	dBi	0.01	0.03

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.700 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz. Rx pol: Horz.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg

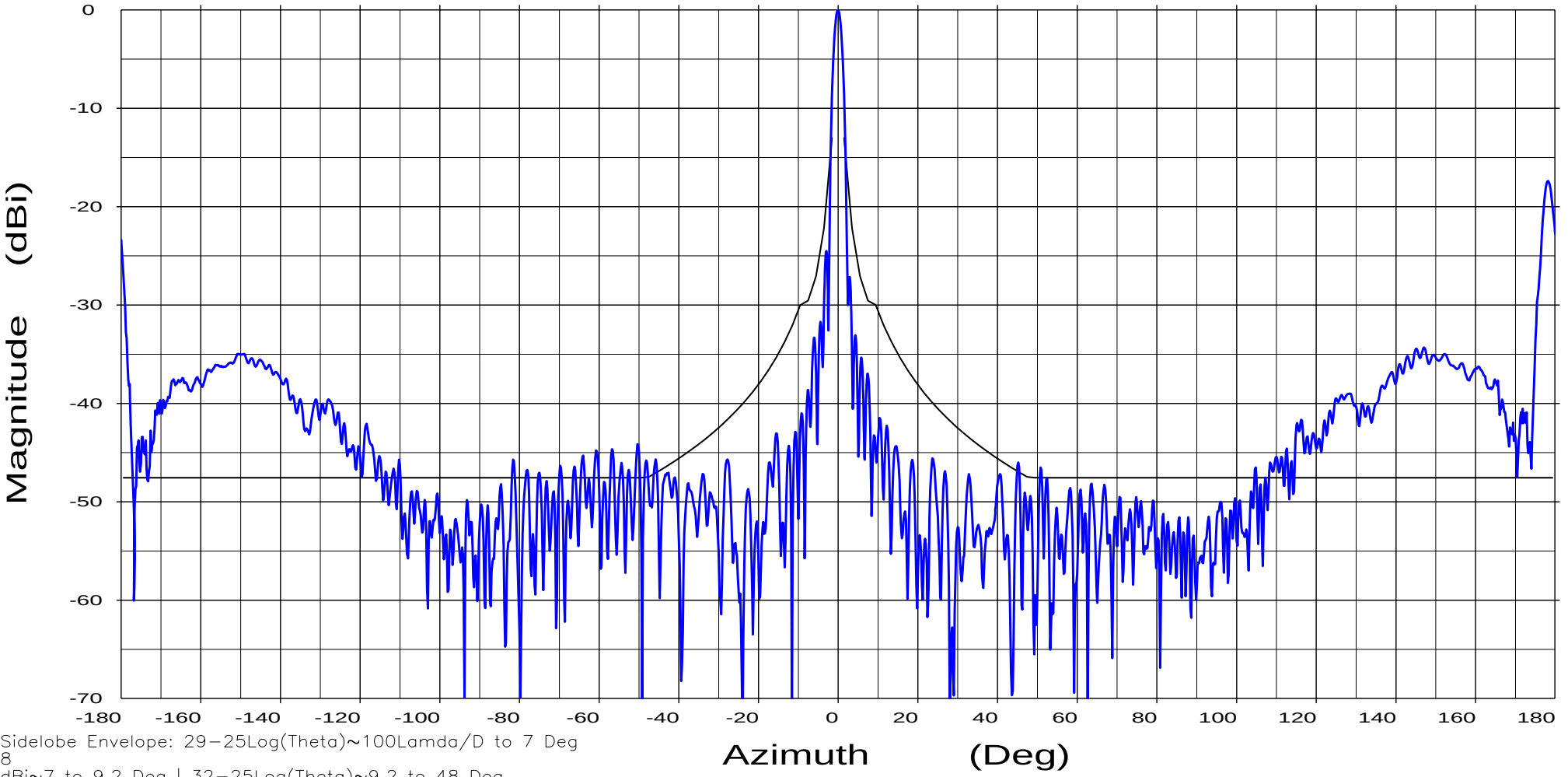
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-10.dat-ant_under_test	1458-10.dat	dBi	-0.03	-0.00

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 11.950 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz. Rx pol: Horz.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg

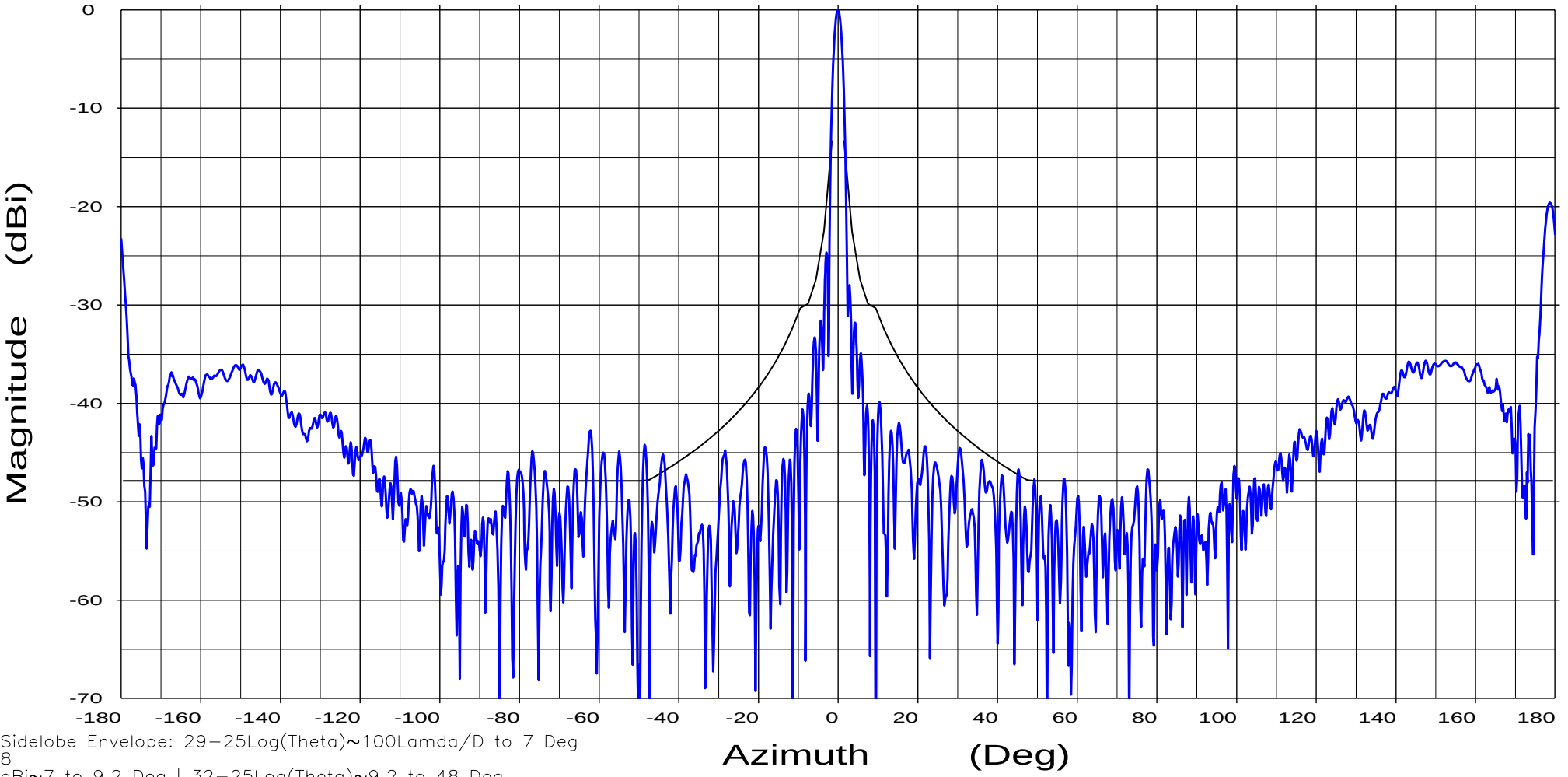
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-10.dat-ant_under_test	1458-10.dat	dBi	-0.03	0.01

Prodelin Corporation
East Maiden Test Range
Maiden NC

74cm Ku-Band Elliptical
Series 1741 Antenna System

Frequency : 12.200 GHz

Operator: D. Lutz
Ser. no.:
Channel: ch1 Tx pol: Horz. Rx pol: Horz.



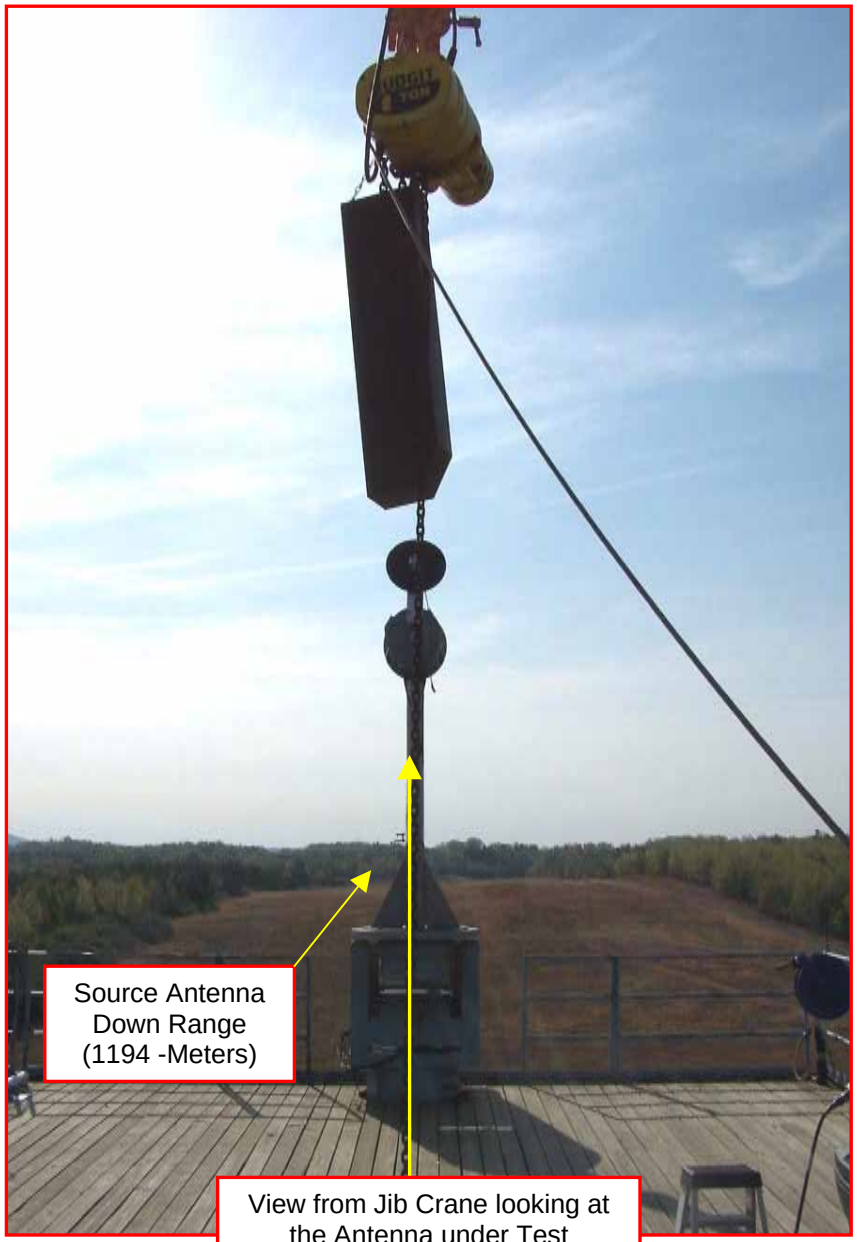
Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 7 Deg
8
dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg

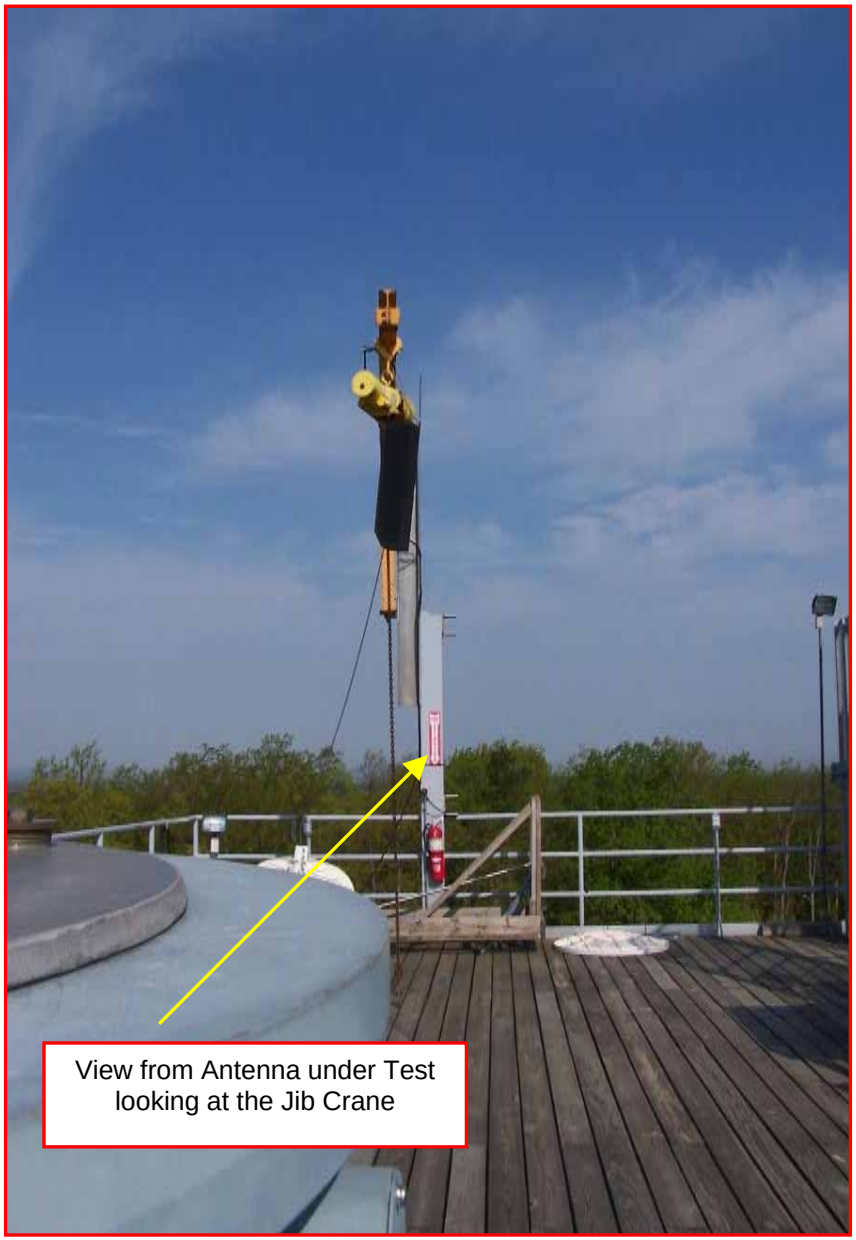
Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
1458/65-10.dat-ant_under_test	1458-10.dat	dBi	-0.03	0.02

Prodelin Corporation
East Maiden Test Range
Maiden NC

Section VI

Photo diagram to show position of the jib-crane in relationship to antenna under test. This metal structure causes reflections visible in our test data when AUT is pointed +/- 173 to 180-degrees from the source antenna. The jib-crane is a permanent structure necessary to lift large antenna systems to the top of platform for testing.






Jib-Crane
AUT
PROCELIN

Section VII

ANTENNA PERFORMANCE STANDARDS

§ 25.209 Antenna performance standards.

(a) The gain of any antenna to be employed in transmission from an earth station in the geostationary satellite orbit fixed-satellite service (GSO FSS) shall lie below the envelope defined as follows:

(1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location:

29-25 $\log_{10}$ (*Theta*) dBi 1° </= *Theta* </= 7°

+8 dBi 7° <Theta</=9.2°

32-25 $\log_{10}$ (Theta) dBi 9.2° <Theta</=48°

−10 dBi 48° <Theta</=180°

where Theta is the angle in degrees from the axis of the main lobe, and dBi refers to dB relative to an isotropic radiator. For the purposes of this section, the peak gain of an individual sidelobe may not exceed the envelope defined above for Theta between 1.0 and 7.0 degrees. For Theta greater than 7.0 degrees, the envelope may be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the gain envelope given above by more than 3 dB.

(2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths:

Outside the main beam, the gain of the antenna shall lie below the envelope defined by:

32-25 $\log_{10}$ (Theta) dBi 1° </=Theta</=48°

−10 dBi 48° <Theta</=180°

where Theta and dBi are defined above. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the gain envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.

(b) The off-axis cross-polarization gain of any antenna to be employed in transmission from an earth station to a space station in the domestic fixed-satellite service shall be defined by:

19-25 $\log_{10}$ (*Theta*) dBi 1.8° <*Theta* </= 7°

−2 dBi 7° <Theta</=9.2°

(c) Earth station antennas licensed for reception of radio transmissions from a space station in the fixed-satellite service are protected from radio interference caused by other space stations only to the degree to which harmful interference would not be expected to be caused to an earth station employing an antenna conforming to the referenced patterns defined in paragraphs (a) and (b) of this section, and protected from radio interference caused by terrestrial radio transmitters identified by the frequency coordination process only to the degree to which harmful interference would not be expected to be caused to

an earth station conforming to the reference pattern defined in paragraph (a)(2) of this section.

(d) The patterns specified in paragraphs (a) and (b) of this section shall apply to all new earth station antennas initially authorized after February 15, 1985 and shall apply to all earth station antennas after March 11, 1994.

(e) The operations of any earth station with an antenna not conforming to the standards of paragraphs (a) and (b) of this section shall impose no limitations upon the operation, location or design of any terrestrial station, any other earth station, or any space station beyond those limitations that would be expected to be imposed by an earth station employing an antenna conforming to the reference patterns defined in paragraphs (a) and (b) of this section.

(f) An earth station with an antenna not conforming to the standards of paragraphs (a) and (b) of this section will be authorized after February 15, 1985 upon a finding by the Commission that unacceptable levels of interference will not be caused under conditions of uniform 2° orbital spacing. An earth station antenna initially authorized on or before February 15, 1985 will be authorized by the Commission to continue to operate as long as such operations are found not to cause unacceptable levels of adjacent satellite interference. In either case, the Commission will impose appropriate terms and conditions in its authorization of such facilities and operations. The applicant has the burden of demonstrating that its antenna not conforming to the standards of paragraphs (a) and (b) of this section will not cause unacceptable interference. This demonstration must comply with the procedures set forth in §25.220.

(g) The antenna performance standards of small antennas operating in the 12/14 GHz band with diameters as small as 1.2 meters starts at 1.25° instead of 1° as stipulated in paragraph (a) of this section.

(h)(1) The gain of any antennas to be employed in transmission from a gateway earth station antenna operating in the frequency bands 10.7–11.7 GHz, 12.75–13.15 GHz, 13.2125–13.25 GHz, 13.8–14.0 GHz, and 14.4–14.5 GHz and communicating with NGSO FSS satellites shall lie below the envelope defined as follows:

$29 - 25\log_{10}(\Theta)$ dBi − 10 dBi

$1^B \leq \Theta \leq 36^B$

$36^B \leq \Theta \leq 180^B$

Where: Θ is the angle in degrees from the axis of the main lobe, and dBi refers to dB relative to an isotropic radiator.

(2) For the purposes of this section, the peak gain of an individual sidelobe may not exceed the envelope defined in paragraph (h)(1) of this section.

[48 FR 40255, Sept. 6, 1983, as amended at 50 FR 2675, Jan. 18, 1985; 50 FR 39004, Sept. 26, 1985; 58 FR 13420, Mar. 11, 1993; 66 FR 10630, Feb. 16, 2001; 70 FR 32255, June 2, 2005]

ANTENNA TEST REQUIREMENTS

§ 25.132 Verification of earth station antenna performance standards.

(a)(1) All applications for transmitting earth stations, except for earth stations operating in the 20/30 GHz band, must be accompanied by a certificate pursuant to §2.902 of this chapter from the manufacturer of each antenna that the results of a series of radiation pattern tests performed on representative equipment in representative configurations by the manufacturer demonstrates that the equipment complies with the performance standards set forth in §25.209. The licensee must be prepared to demonstrate the measurements to the Commission on request.

(2) All applications for transmitting earth stations operating in the 20/30 GHz band must be accompanied by the measurements specified in §§25.138(d) and (e).

(b)(1) In order to demonstrate compliance with §25.209 (a) and (b), the following measurements on a production antenna performed on calibrated antenna range, as a minimum, shall be made at the bottom, middle and top of each allocated frequency band and submitted to the Commission:

(i) Co-polarized patterns for each of two orthogonal senses of polarizations in two orthogonal cuts of the antenna.

(A) In the azimuth plane, plus and minus 7 degrees and plus and minus 180 degrees.

(B) In the elevation plane, zero to forty-five degrees.

(ii) Cross-polarization patterns in the E- and H-planes, plus and minus 9 degrees.

(iii) Main beam gain.

(2) The FCC envelope specified in §25.209 shall be superimposed on each pattern. The minimum tests specified above are recognized as representative of the performance of the antenna in most planes although some increase in sidelobe levels should be expected in the spar planes and orthogonal spar planes.

(3) Applicants seeking authority to use an antenna that does not meet the standards set forth in §25.209(a) and (b), pursuant to the procedure set forth in §25.220, are required to submit a copy of the manufacturer's range test plots of the antenna gain patterns specified in paragraph (b)(1) of this section.

(c) The tests specified in paragraph (b) of this section are normally performed at the manufacturer's facility; but for those antennas that are very large and only assembled on-site, on-site measurements may be used for product qualification data. If on-site data is to be used for qualification, the test frequencies and number of patterns should follow, where possible, the recommendations in paragraph (b) of this section, and the test data is to be submitted in the same manner as described in paragraph (a) of this section.

(d) For each new or modified transmitting antenna over 3 meters in diameter, the following on-site verification measurements must be completed at one frequency on an available transponder in each frequency band of interest and submitted to the Commission.

(1) Co-polarized patterns in the elevation plane, plus and minus 7 degrees, in the transmit band.

(2) Co-polarized patterns in the azimuth and elevation planes, plus and minus 7 degrees, in the receive band.

(3) *System cross-polarization discrimination on-axis.* The FCC envelope specified in §25.209 shall be superimposed on each pattern. The transmit patterns are to be measured with the aid of a co-operating earth station in coordination with the satellite system control center under the provisions of §25.272.

(e) Certification that the tests required by paragraph (c) of this section have been satisfactorily performed shall be provided to the Commission in notification that construction of the facilities has been completed as required by §25.133.

(f) Antennas less than 3 meters in diameter and antennas on simple (manual) drive mounts that are operated at a fixed site are exempt from the requirements of paragraphs (c) and (d) of this section provided that a detailed technical showing is made that confirms proper installation, pointing procedures, and polarization alignment and manufacturing quality control. These showing must also include a plan for periodic testing and field installation procedures and precautions.

(g) Records of the results of the tests required by this section must be maintained at the antenna site or the earth station operator's control center and be available for inspection.

[58 FR 13419, Mar. 11, 1993, as amended at 69 FR 5710, Feb. 6, 2004; 70 FR 32253, June 2, 2005]

NEW FCC RULING TO AUTOMATE APPLICATIONS

FOR NON-CONFORMING ANTENNAS

§ 25.220 Non-conforming transmit/receive earth station operations.

(a)(1) This section applies to earth station applications other than ESV applications in which:

(i) The proposed antenna does not conform to the standards of §§25.209(a) and

(b), and/or

(ii) The proposed power density levels are in excess of those specified in §25.134, §25.211, or §25.212, or those derived by the procedure set forth in paragraph (c)(1) of this section, whichever is applicable.

(2) Paragraphs (b) through (e) and (g) of this section apply to the earth station applications described in paragraph (a)(1) of this section, in which the applicant seeks transmit/receive authority.

(3) Paragraphs (f) and (g) of this section applies to the earth station applications described in paragraph (a)(1) of this section in which the applicant seeks transmit-only or receive-only authority.

(4) The requirements for petitions to deny applications filed pursuant to this section are set forth in §25.154.

(b) If an antenna proposed for use by the applicant does not comply with the antenna performance standards contained in §25.209(a) and (b), the applicant must provide, as an exhibit to its FCC Form 312 application, the antenna gain patterns specified in §25.132(b).

(c) If an antenna proposed for use by the applicant does not comply with the performance standards contained in §25.209(a) and (b), the applicant must meet the requirements of either paragraph (c)(1) or (c)(2) of this section to obtain authority to transmit. The applicant must meet the requirements of paragraph (c)(3) of this section to obtain protection from receiving interference from adjacent satellite operators.

(1) The applicant must provide in its Form 312, Schedule B, the power and power density levels that result by reducing the values stated in §§25.134, 25.211, or 25.212, whichever is applicable, by the number of decibels that the non-compliant antenna fails to meet the antenna performance standard of §25.209(a) and (b), or

(2) The applicant will not be permitted to transmit to any satellite unless the applicant has provided the certifications listed in paragraph (e)(1) of this section from the operator of that satellite(s).

(3) The applicant will not receive protection from adjacent satellite interference from any satellite unless the applicant has provided the certifications listed in paragraph (d)(1) of this section from the operator of that satellite(s) from which it plans to receive.

(d)(1) If an antenna proposed for use by the applicant does not comply with the performance standards contained in §25.209(a) and (b), the applicant must submit the certifications listed in paragraphs (d)(1)(i) through (d)(1)(iv) of this section to qualify for protection from receiving interference from other satellite systems. The applicant will be granted protection from receiving interference only with respect to the satellite systems included in the coordination agreements referred to in the certification required by paragraph (d)(1)(ii) of this section, and only to the extent that protection from receiving interference is afforded by those coordination agreements.

(i) A statement from the satellite operator acknowledging that the proposed operation of the subject non-conforming earth station with its satellite(s) has the potential to receive interference from adjacent satellite networks that may be unacceptable.

(ii) A statement from the satellite operator that it has coordinated the operation of the subject non-conforming earth station accessing its satellite(s), including its required downlink power density based on the information contained in the application, with all adjacent satellite networks within 6° of orbital separation from its satellite(s), and the operations will operate in conformance with existing coordination agreement for its satellite(s) with other satellite systems.

(iii) A statement from the satellite operator that it will include the subject non-conforming earth station operations in all future satellite network coordinations, and

(iv) A statement from the earth station applicant certifying that it will comply with all coordination agreements reached by the satellite operator(s).

(2) A license granted pursuant to paragraph (d)(1) of this section will include, as a condition on that license, that if a good faith agreement cannot be reached between the satellite operator and the operator of a future 2° compliant satellite, the earth station operator shall accept the power density levels that would accommodate the 2° compliant satellite.

(e)(1) An earth station applicant proposing to use transmitted satellite carrier EIRP densities, and/or maximum power into the antenna in excess of the levels in §§25.134, 25.211, 25.212, or the power density levels derived through the procedure set forth in paragraph (c)(1) of this section, whichever is applicable, shall provide the following certifications as an exhibit to its earth station application:

(i) A statement from the specified satellite operator acknowledging that the proposed operation of the subject non-conforming earth station with its satellite(s) has the potential to create interference to adjacent satellite networks that may be unacceptable.

(ii) A statement from the specified satellite operator that it has coordinated the operation of the subject non-conforming Earth Station accessing its satellite(s), and its corresponding downlink power density requirements (based on the information contained

in the application) with all adjacent satellite networks within 6° of orbital separation from its satellite(s), and the operations will not violate any existing coordination agreement for its satellite(s) with other satellite systems.

(iii) A statement from the specified satellite operator that it will include the subject non-conforming Earth Station power and power densities in all future satellite network coordinations, and

(iv) A statement from the earth station applicant certifying that it will comply with all coordination agreements reached by the satellite operator(s).

(2) A license granted pursuant to paragraph (e)(1) of this section will include, as a condition on that license, that if a good faith agreement cannot be reached between the satellite operator and the operator of a future 2° compliant satellite, the earth station operator shall reduce its power to those levels that would accommodate the 2° compliant satellite.

(f)(1) If an earth station applicant requests transmit-only authority, and its proposed antenna does not conform to the standards of §25.209(a) and (b), it must meet the requirements of paragraphs (b) and (c) of this section.

(2) If an earth station applicant requests transmit-only authority, and its proposed power density levels are in excess of those specified in §§25.134, 25.211, or 25.212, or those derived by the procedure set forth in paragraph (c)(1) of this section, it must meet the requirements of paragraph (e) of this section.

(3) If an earth station applicant requests receive-only authority, and its proposed antenna does not conform to the standards of §25.209(a) and (b), it must meet the requirements of paragraphs (b) and (d) of this section.

(g) Applicants filing applications for earth stations pursuant to this section must provide the following information for the Commission's public notice:

(1) Detailed description of the service to be provided, including frequency bands and satellites to be used. The applicant must identify either the specific satellites with which it plans to operate, or the eastern and western boundaries of the geostationary satellite orbit arc it plans to coordinate.

(2) The diameter or equivalent diameter of the antenna.

(3) Proposed power and power density levels.

(4) Identification of any rule or rules for which a waiver is requested.

[70 FR 32256, June 2, 2005]