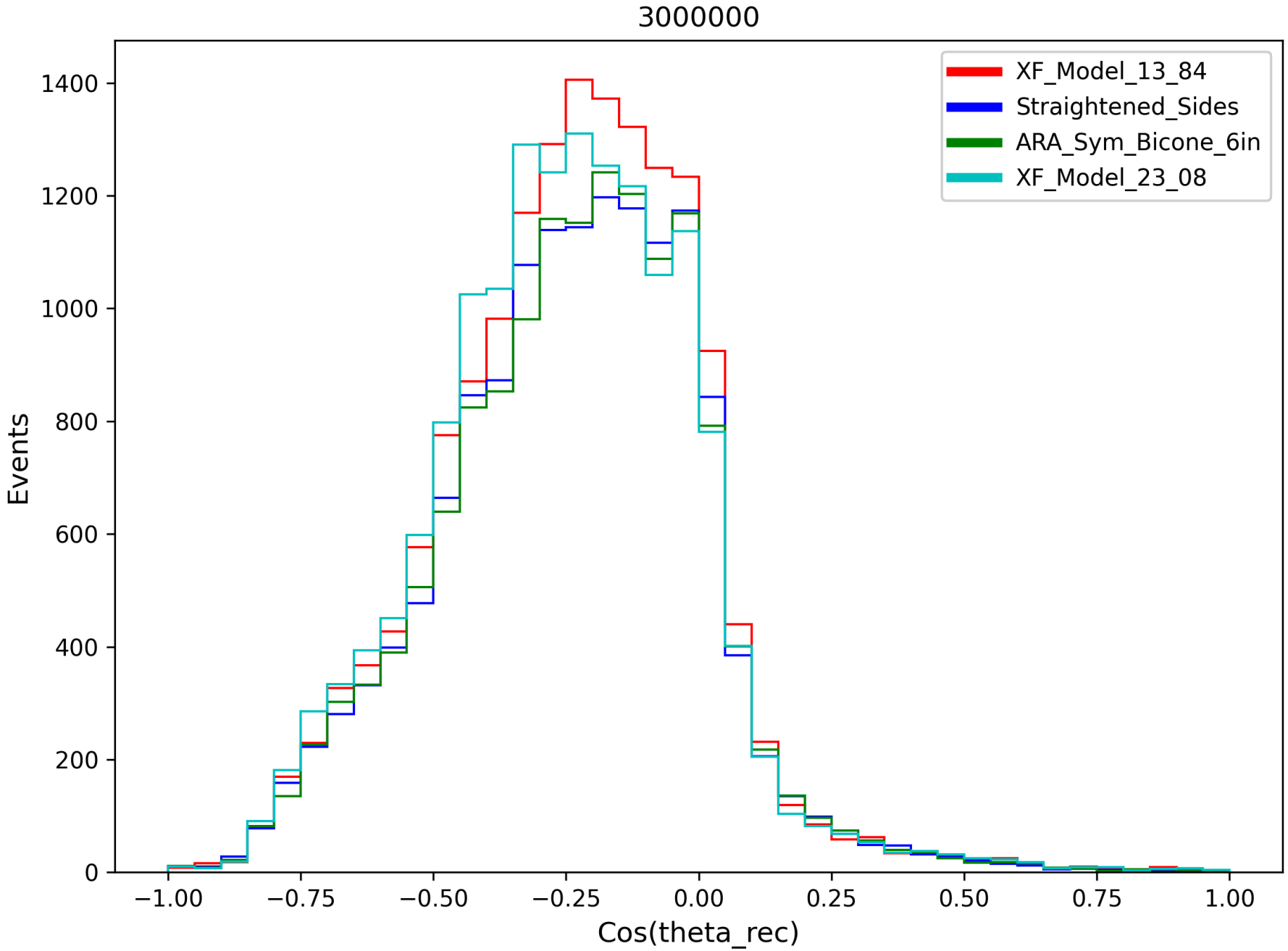
Straightened Sides AraSim Results

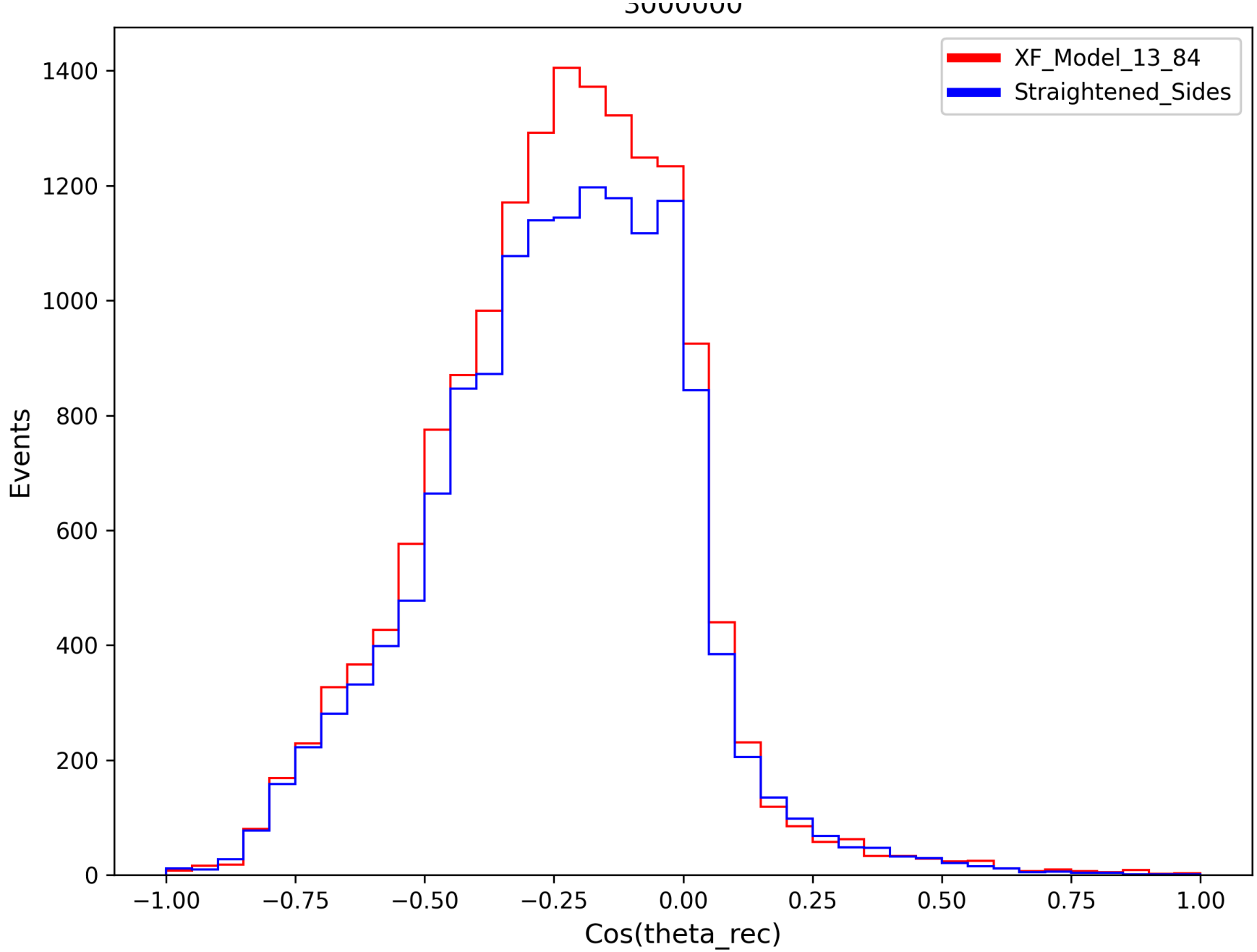
Jack Tillman

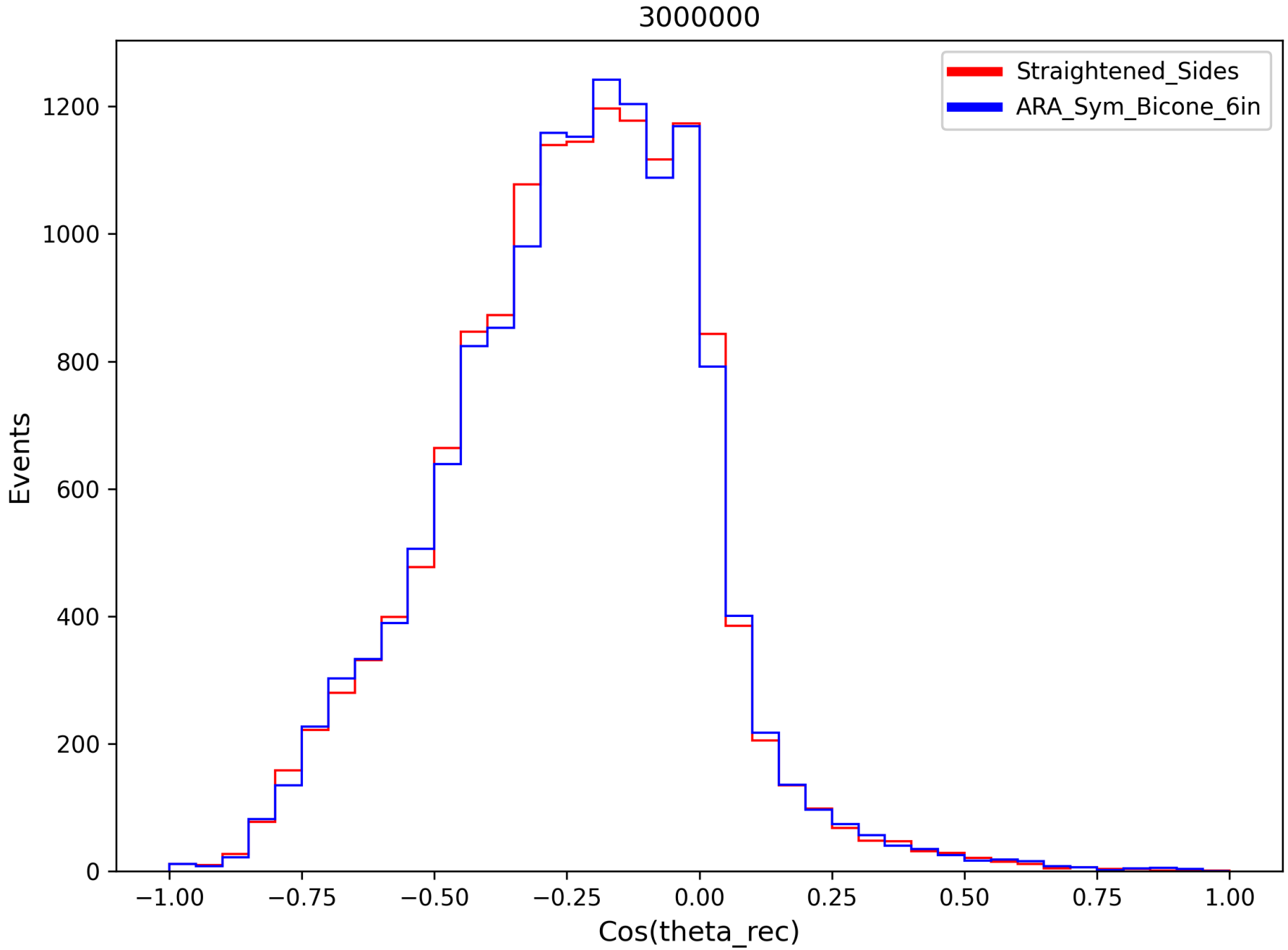
AraSim Results

Antenna Model	Curved Sides	Straightened Sides	Original Bicone	Paper Antenna
Total Events	2985982	3000000	3000000	3000000
Triggered	40108	36474	36510	41014
Usable	40091	36459	36496	40994
Weighted	16010.76133	14367.39220	14281.51762	15649.63764
Effective Volume	5.71542	5.10482	5.07431	5.56040
Effective Volume Error	±0.035	±0.028	±0.032	±0.029

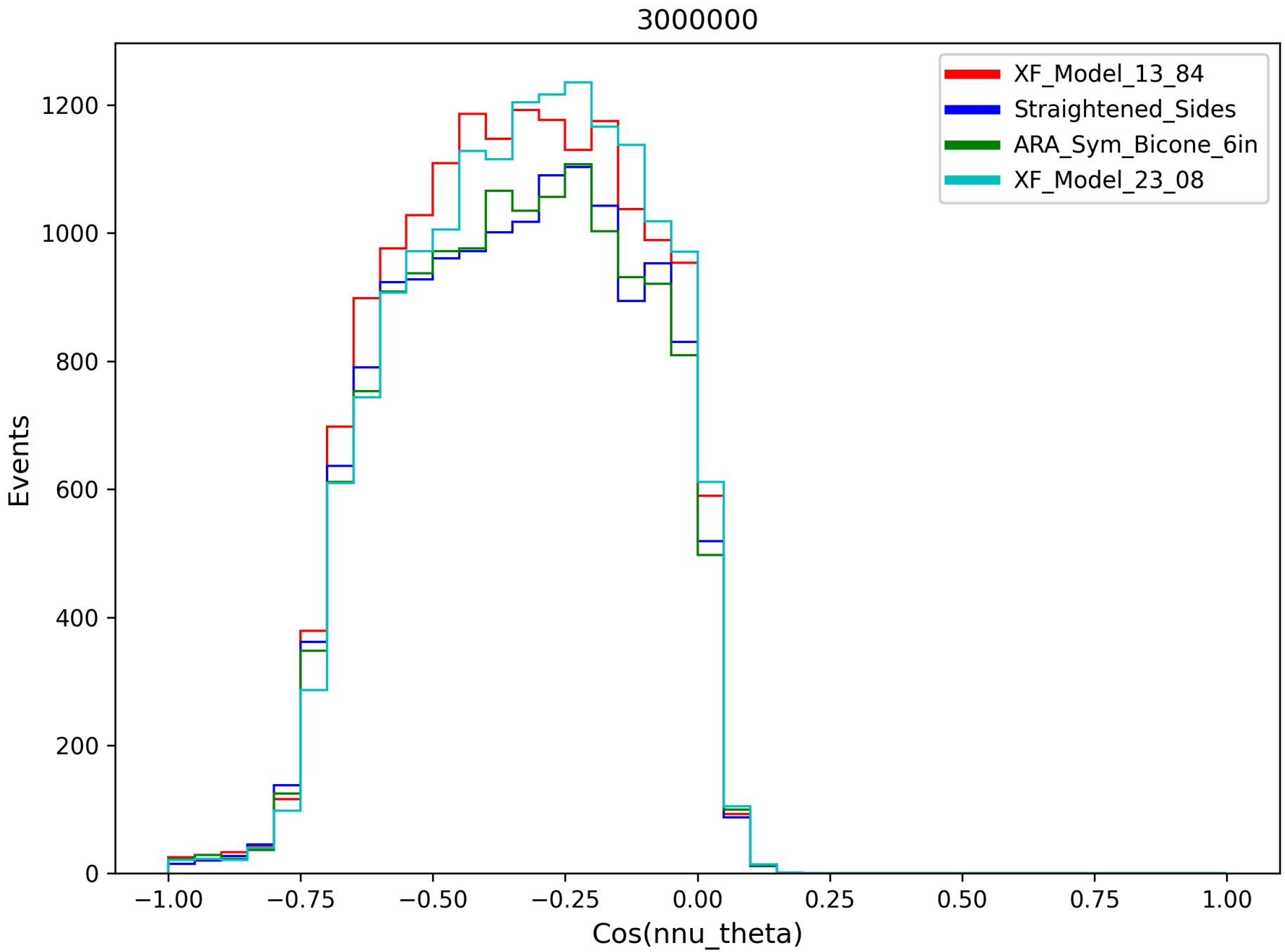
- Note: The following plots are of the cosine of the angle of the received radio frequency, theta_rec
- Theta_rec results from the conic shower of Askaryan radiation produced by the neutrino in ice
- Theta_rec is measured with respect to a vertical axis

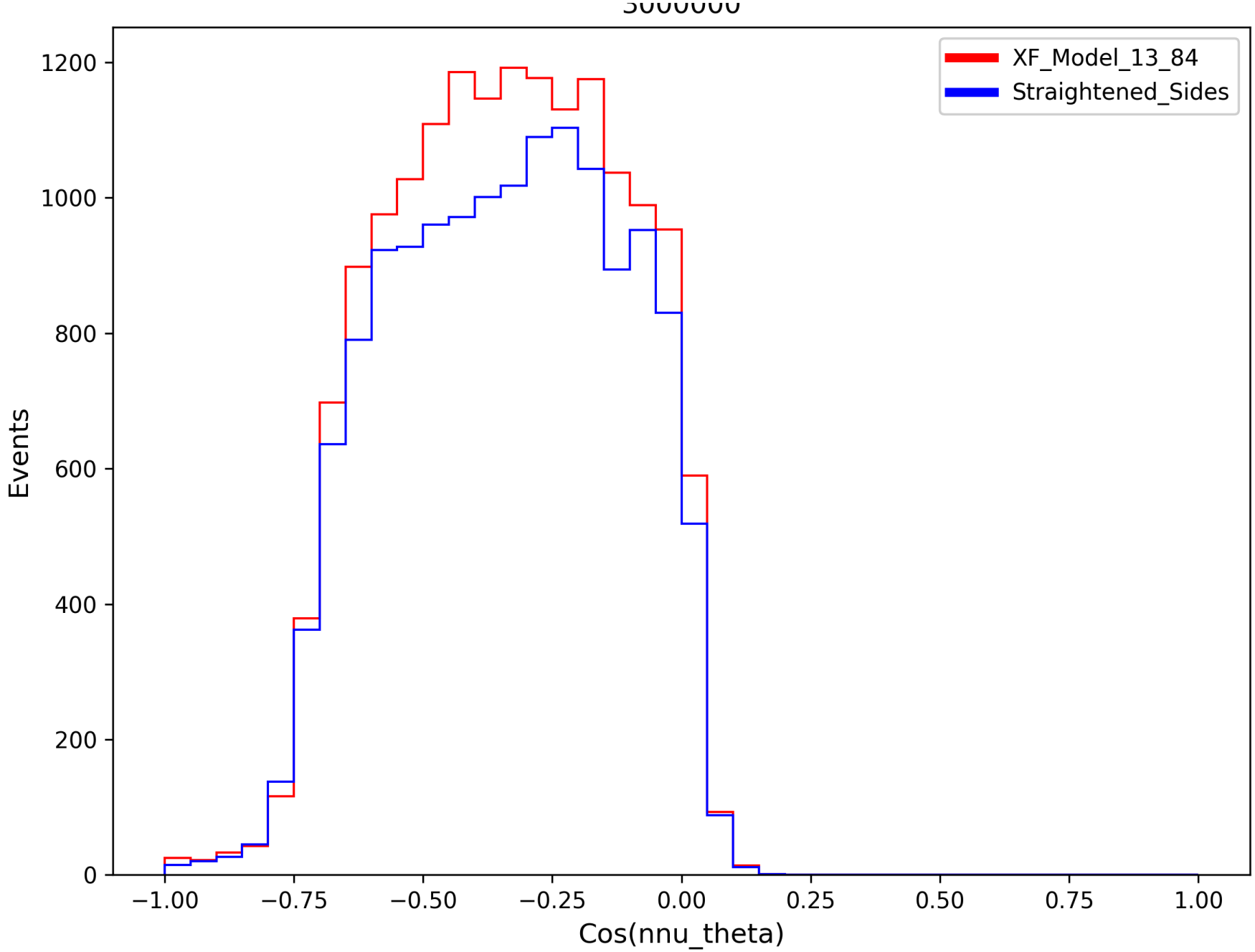

3000000
XF_Model_13_84
Straightened_Sides
ARA_Sym_Bicone_6in
XF_Model_23_08
Events
0
200
400
600
800
1000
1200
1400
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
Cos(theta_rec)

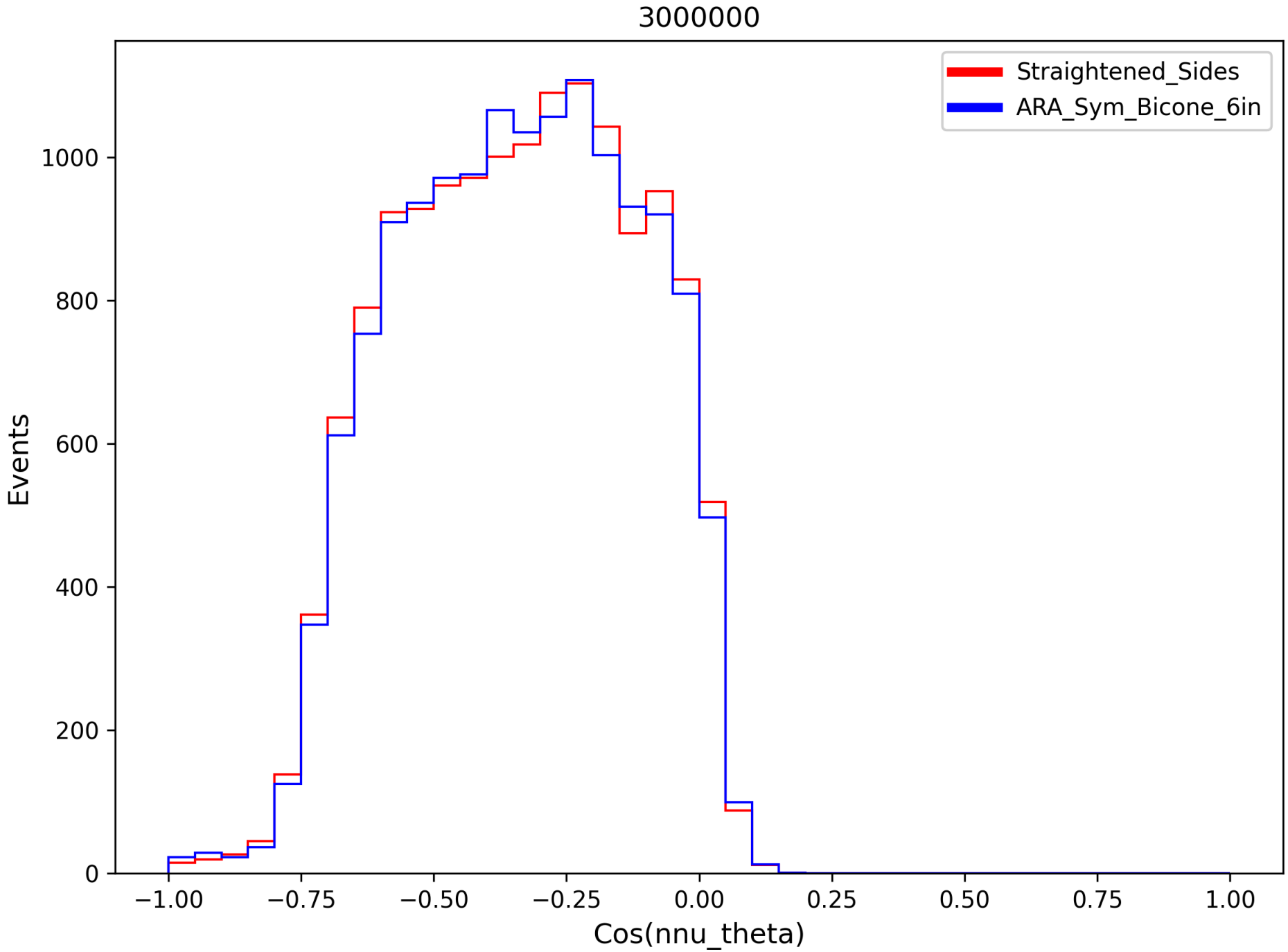

3000000
XF_Model_13_84
Straightened_Sides
1400
1200
1000
800
600
400
200
0
Events
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
Cos(theta_rec)


3000000
Straightened_Sides
ARA_Sym_Bicone_6in
Events
0
200
400
600
800
1000
1200
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
Cos(theta_rec)

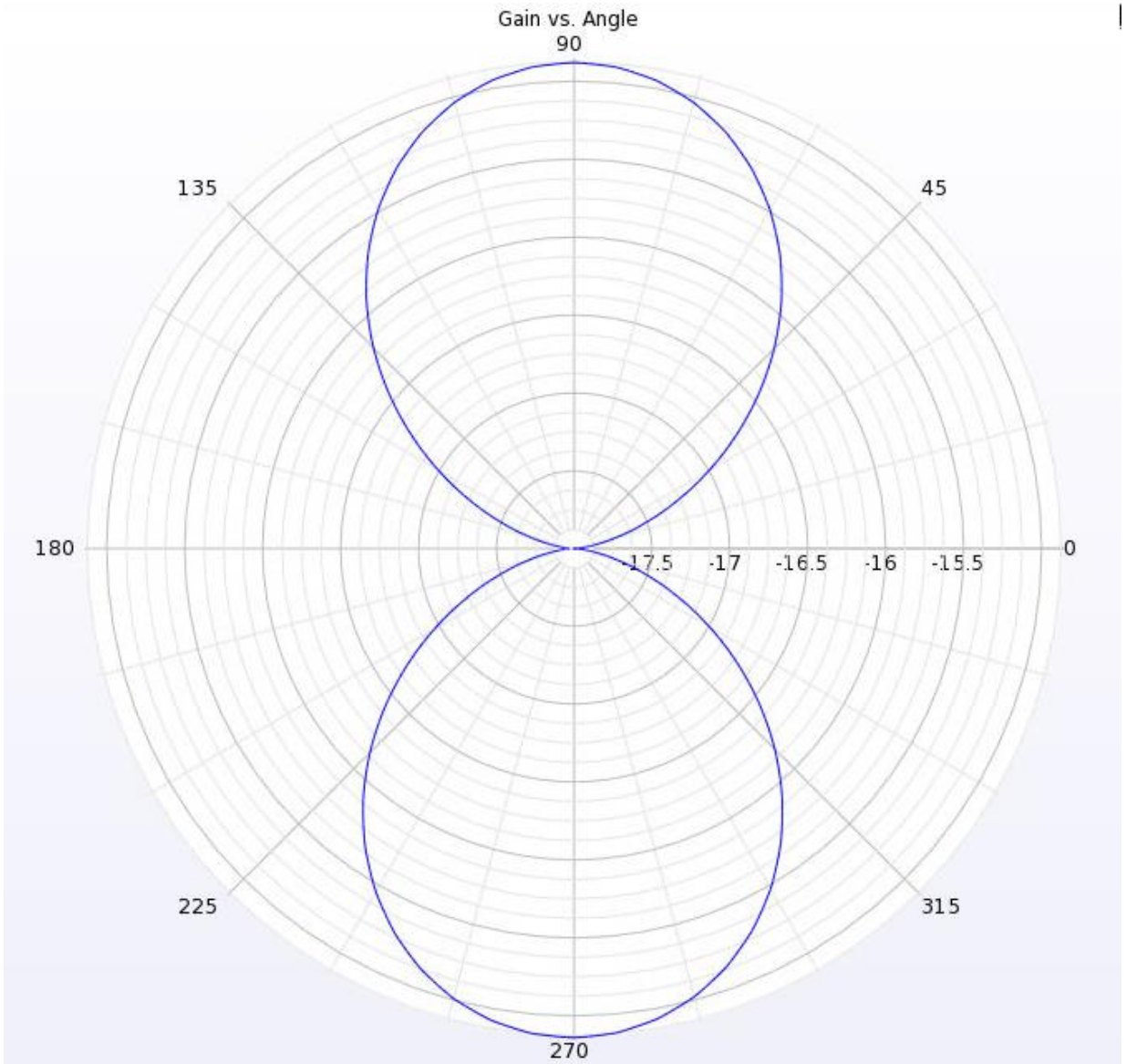
- Note: The following plots are of the cosine of the angle of the incoming neutrino, nnu_theta
- Nnu_theta represents the angle of the trajectory of the neutrino before interaction when measured with respect to a vertical axis


3000000
XF_Model_13_84
Straightened_Sides
ARA_Sym_Bicone_6in
XF_Model_23_08
Events
0
200
400
600
800
1000
1200
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
Cos(nnu_theta)

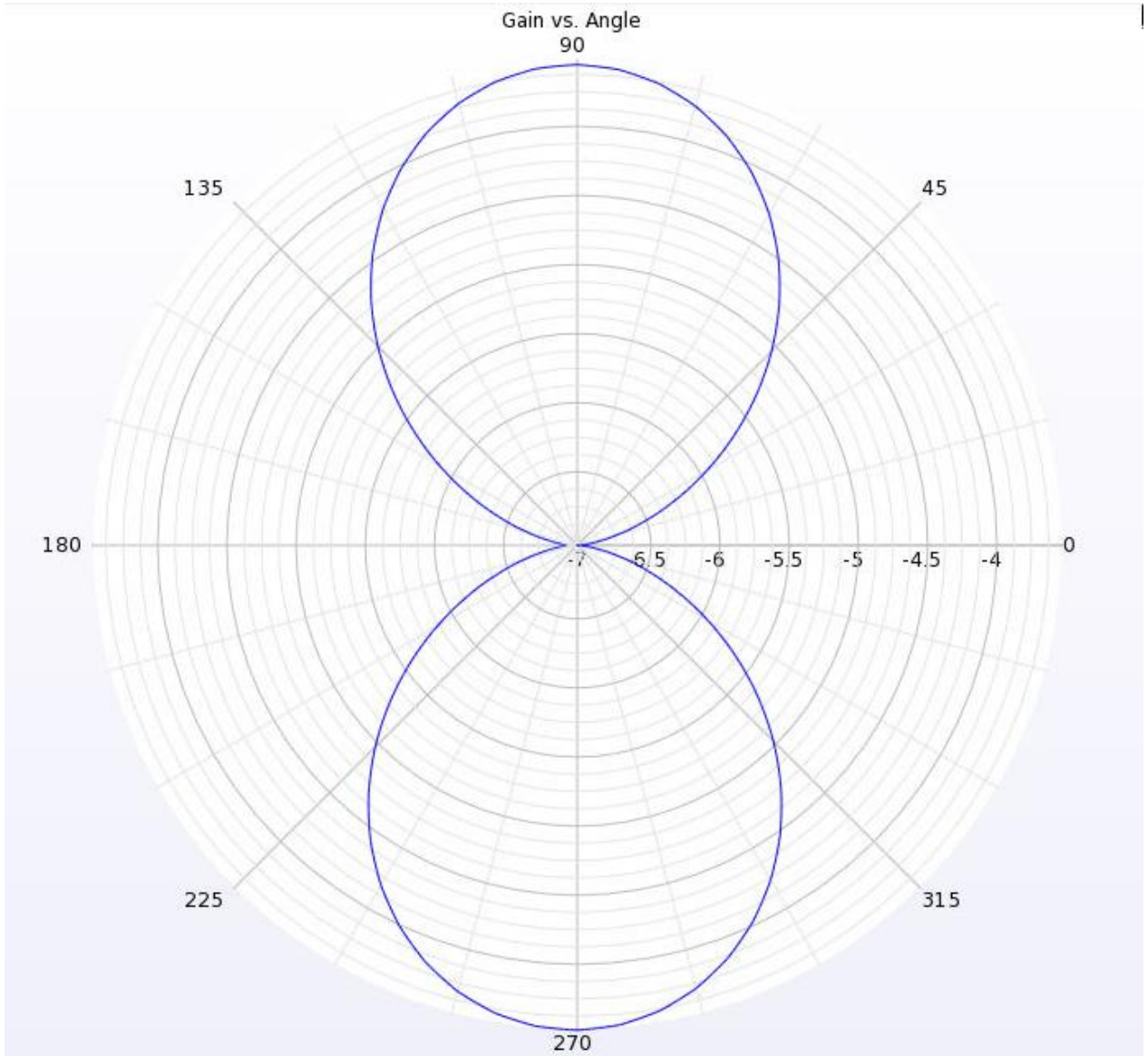

XF_Model_13_84
Straightened_Sides
Events
Cos(nnu_theta)
0
200
400
600
800
1000
1200
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00


3000000
Straightened_Sides
ARA_Sym_Bicone_6in
Events
0
200
400
600
800
1000
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
Cos(nnu_theta)

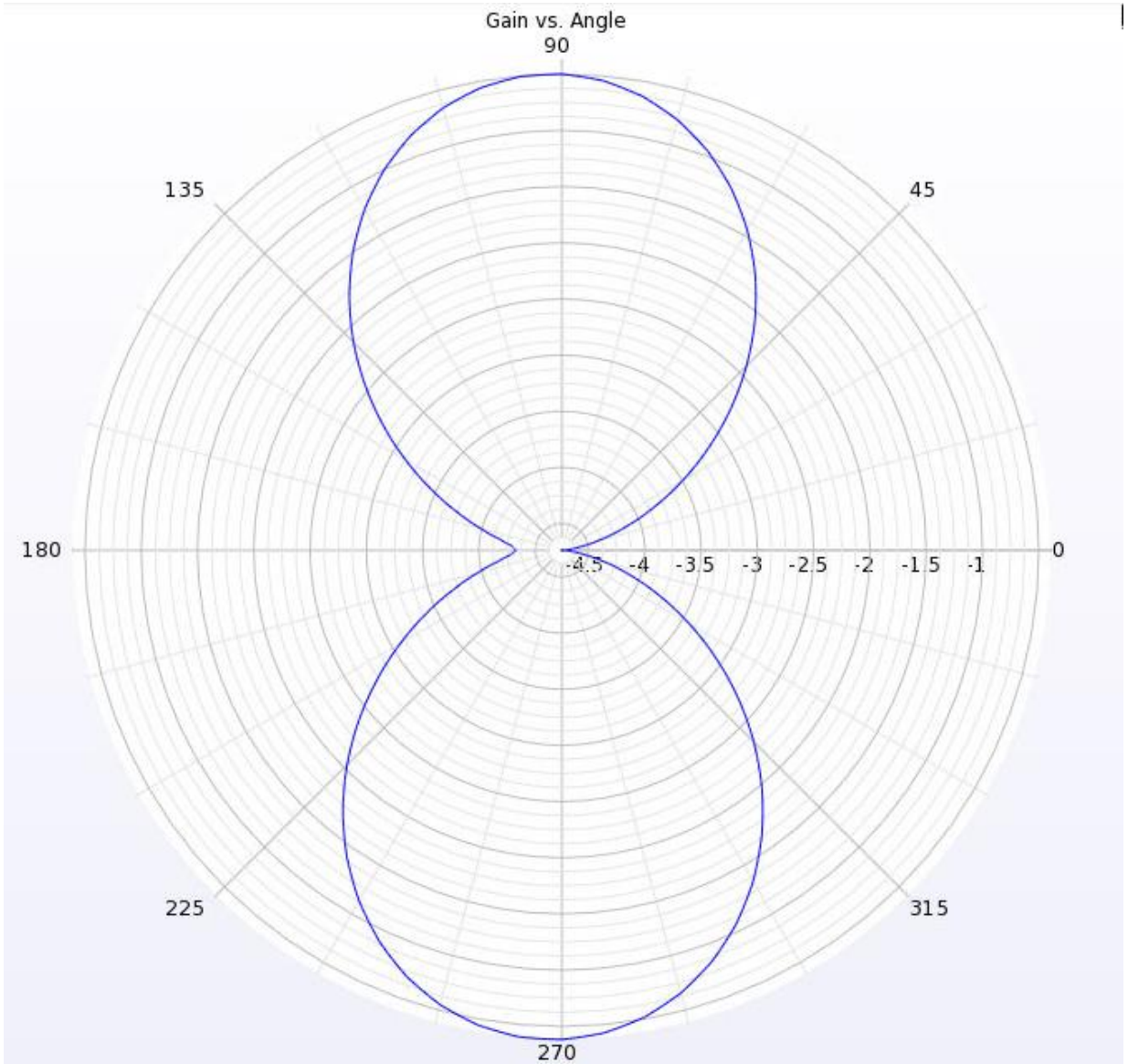
- Note: The following plots are beam patterns for the straightened sides antenna
- In these plots, 0 degrees is on the right and refers to pointing directly up when the antenna is oriented correctly



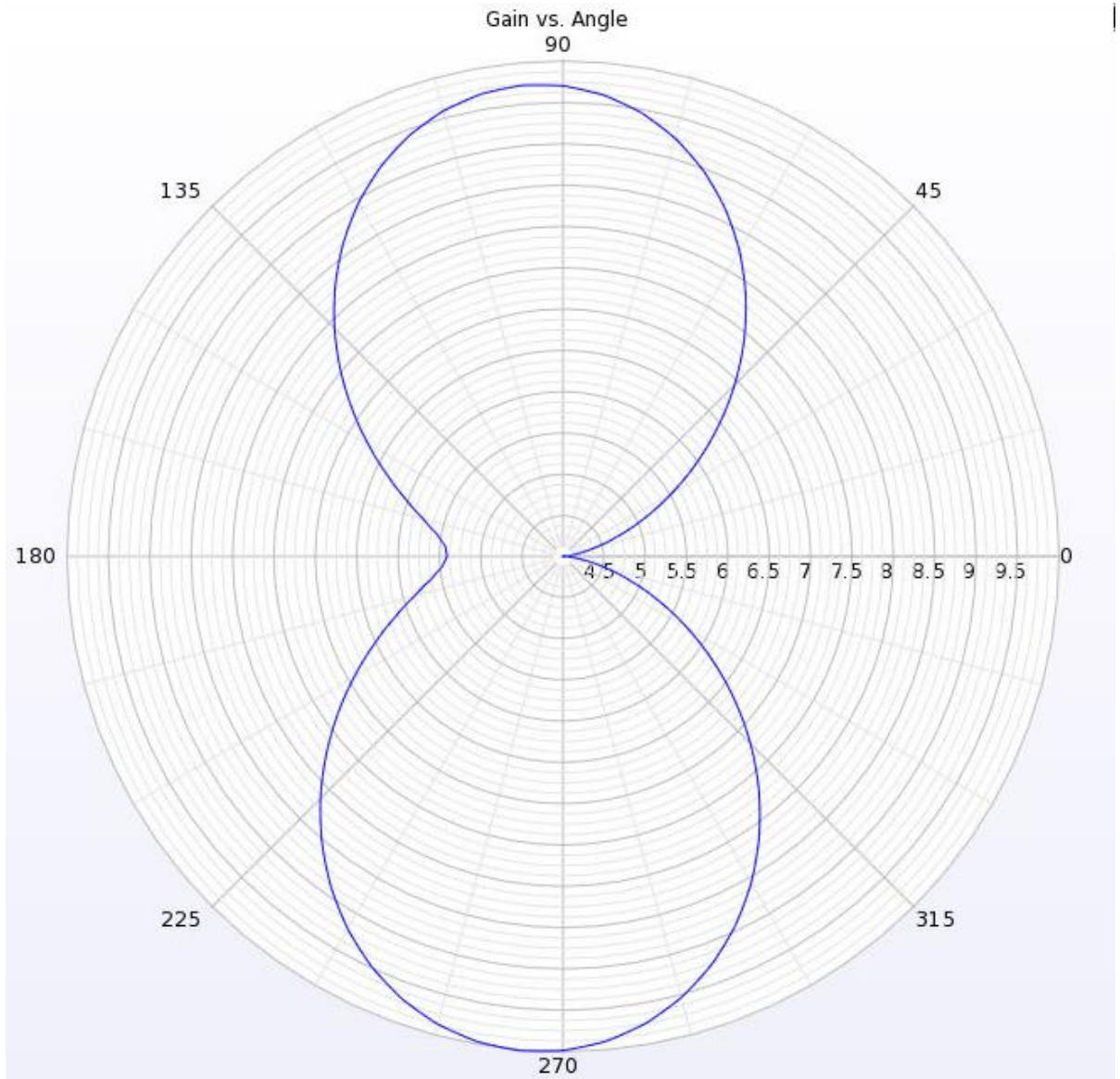
100 MHz Beam Pattern



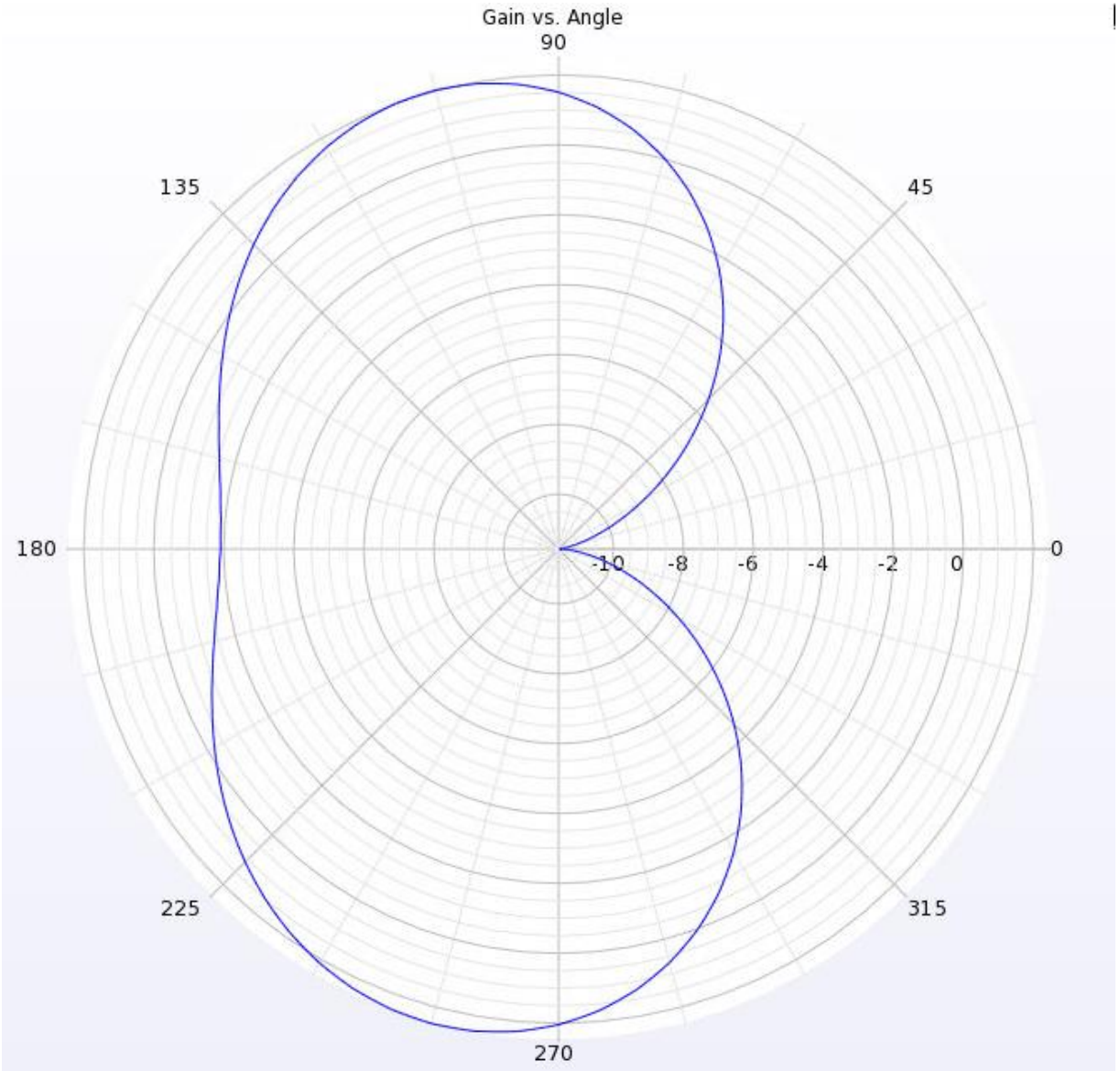
200 MHz Beam Pattern



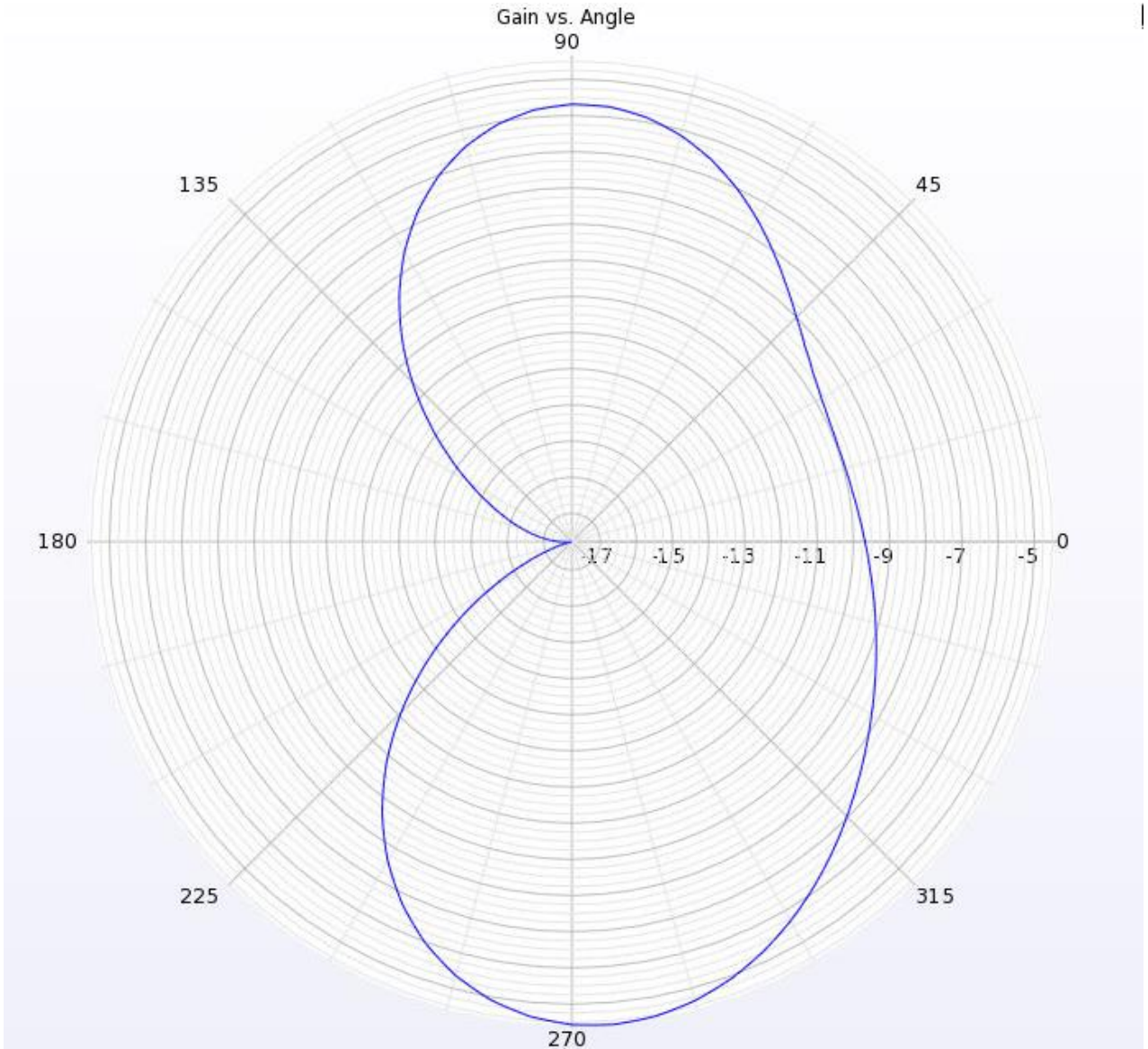
300 MHz Beam Pattern



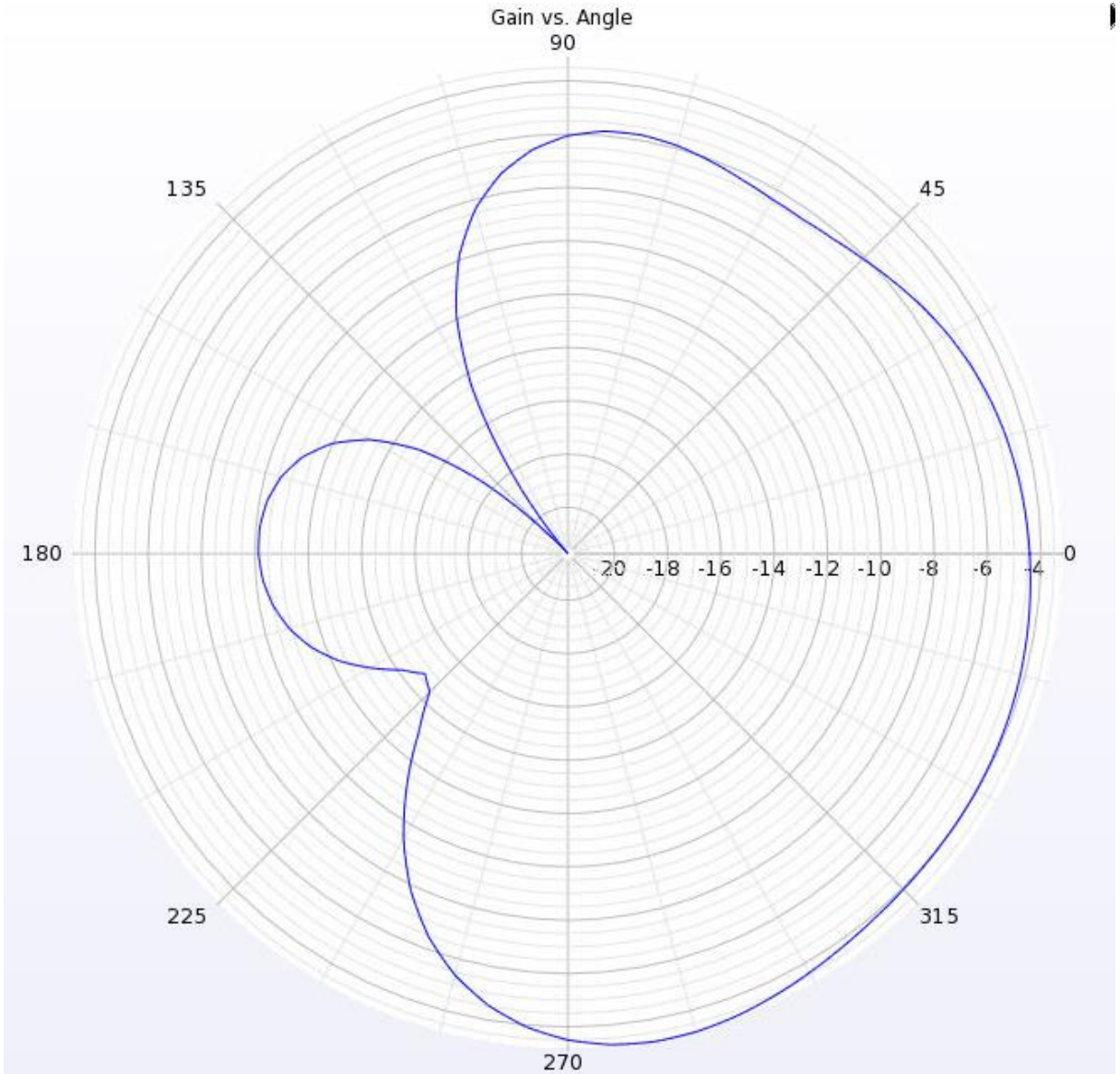
400 MHz Beam Pattern



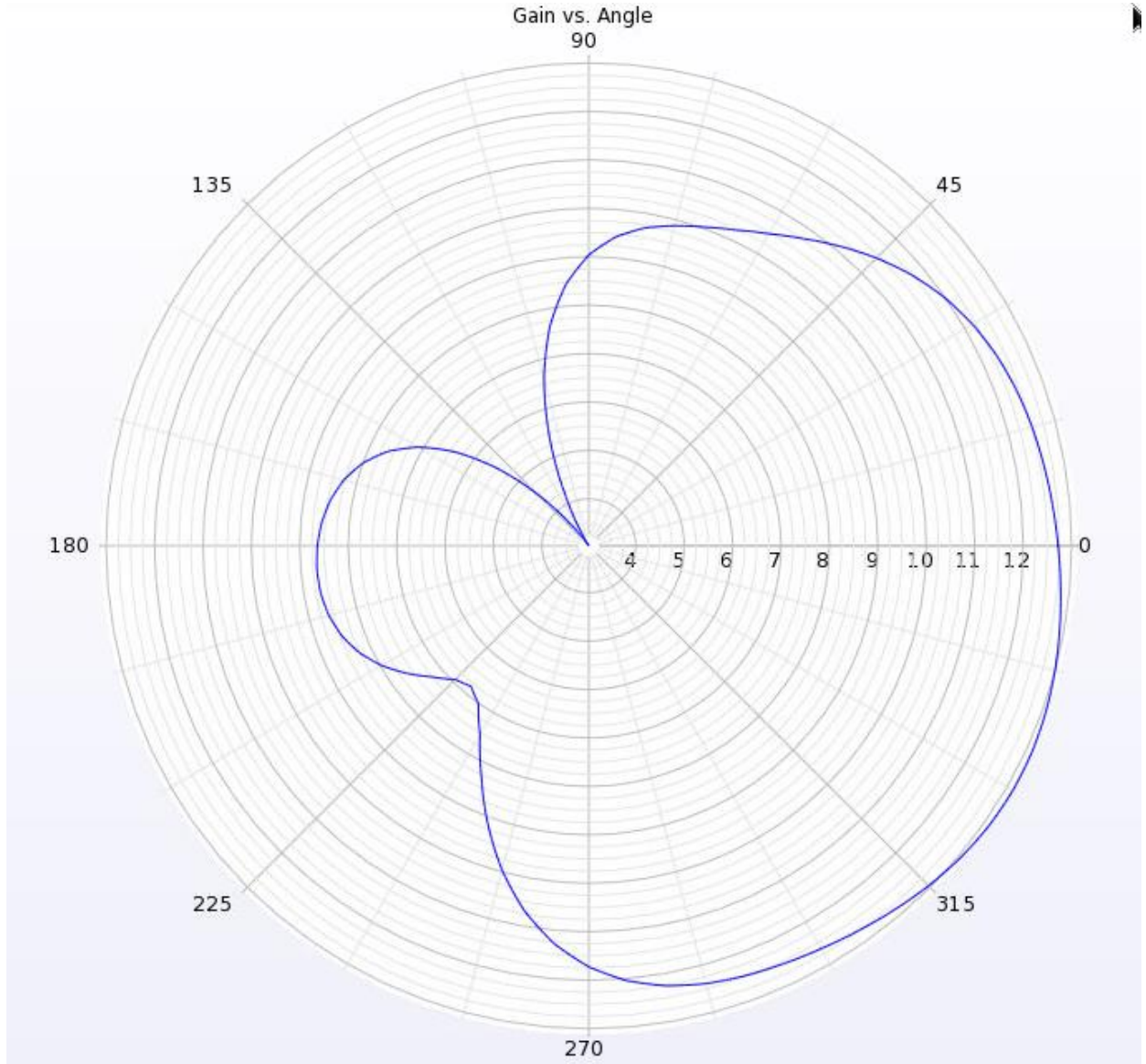
500 MHz Beam Pattern



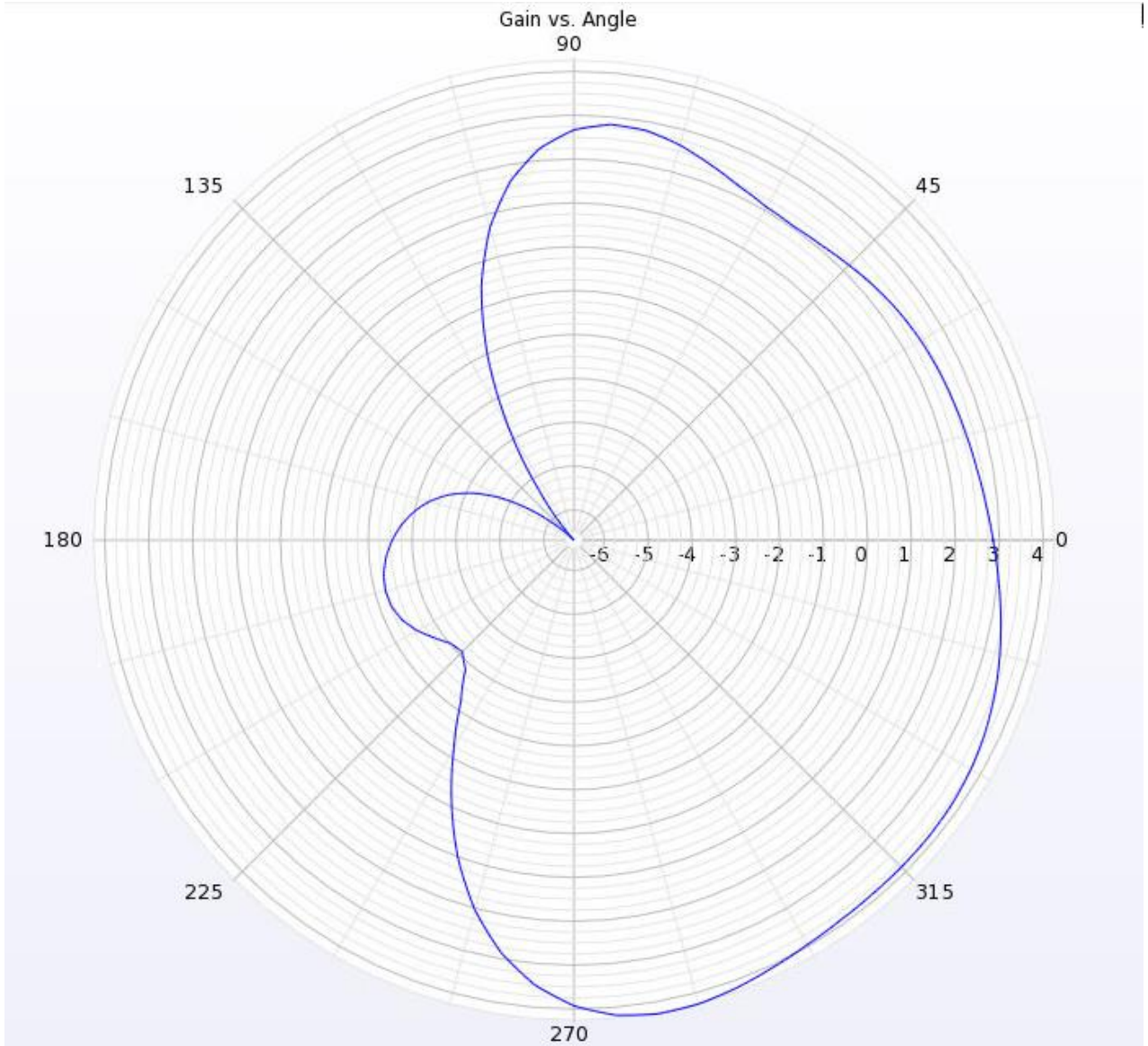
600 MHz Beam Pattern



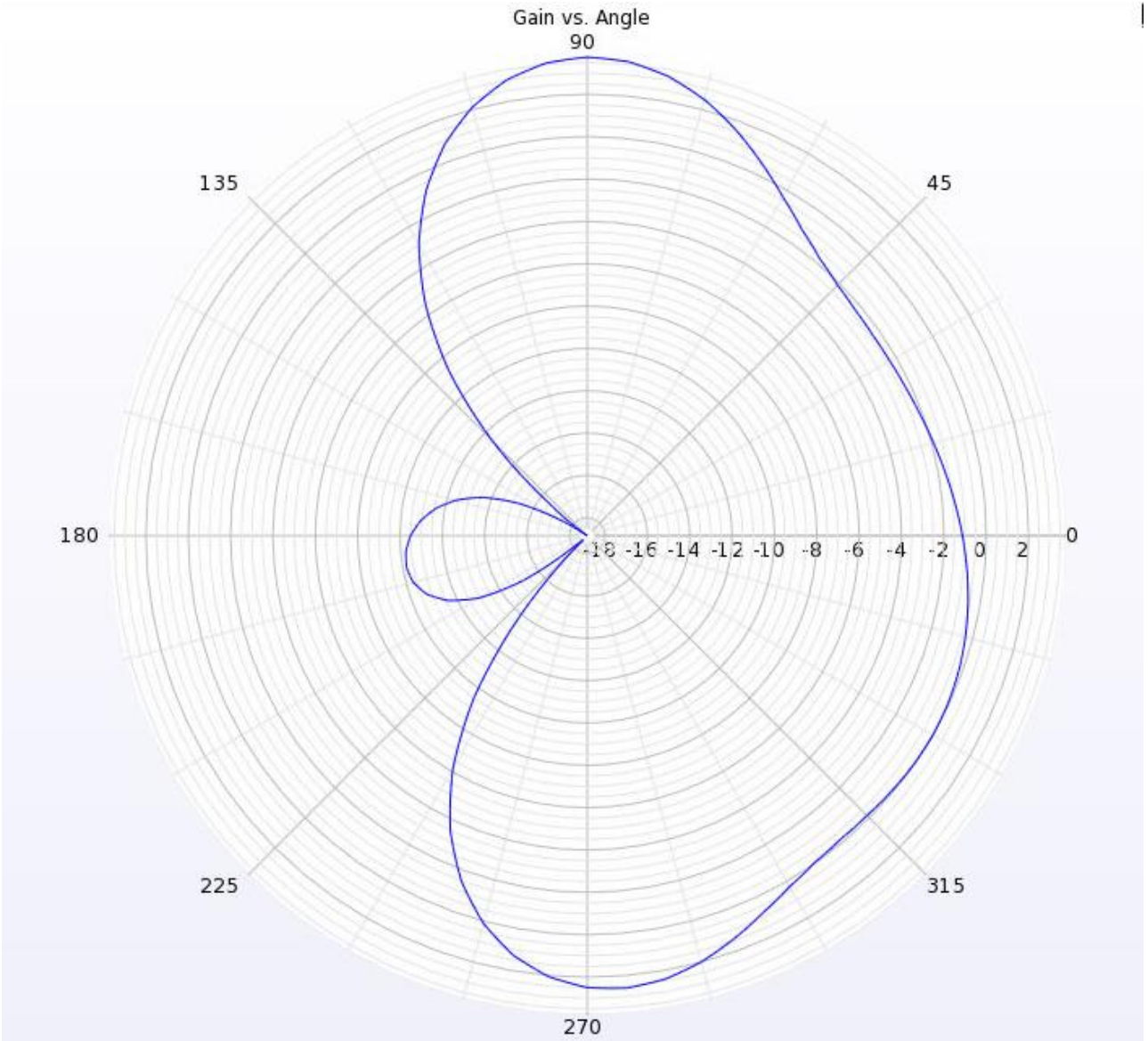
700 MHz Beam Pattern



800 MHz Beam Pattern



900 MHz Beam Pattern



1 GHz Beam Pattern