

# **ENGINEERING REPORT**

## **Minor Modification Construction Permit Application**

for

**W270DT**

**Facility ID: 141386**

as a non-Fill-In Translator for  
**WDUR(AM) – Durham, NC**

August 2023

***MUNN-REESE***

Broadcast Engineering Consultants  
Coldwater, MI 49036

## Discussion

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This firm has been retained to prepare the required engineering report in support of a Minor Modification Construction Permit Application for an FM Translator W270DT. Currently this translator is licensed to operate with an AMSL of 186 meters and an ERP of 0.12 kW (H&V) operating on CH270D. This proposal requests a an AMSL of 186 meters and an ERP of 0.25 kW (H&V) operating on CH270D. The Fill-In Translator will rebroadcast Primary Station WDUR(AM) – Facility ID No. 36943.

The Translator presently licensed and as proposed will be mounted on a tower bearing Antenna Structure Registration Number 1016459.

A map of the present and proposed service area has been included in **Exhibit 1.0**. This non fill-in translator's power is limited to 55 watts based on the HAAT. A HAAT table is included in **Exhibit 1.0**.

It has been determined the Translator may be used in the area without interference to any existing FM broadcast station or facility. The present allocation is included in **Exhibit 2.0** and the proposed allocation is included in **Exhibit 2.1**. It is believed sufficient clearance exists precluding the need for additional contour protection showings.

The applicant would like to note the existence of a §74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WRAL(FM) and WKXU(FM) in **Exhibit 3.0**. Protection has been based on the worst case calculated 110.9 dBμ F(50:10) Interference Contour, corresponding to the worst case 709 dBμ F(50:50). A downward radiation study, **Exhibit 3.1**, shows that the interference will hit the ground within a 90 meter radius of the site however that area is free of housing and main roads as shown in **Exhibit 3.1**.

This translator is not within the affected distance of any TV Channel 6 stations.

The applicant would like to note use of the NED 03 second terrain database for terrain-based showings contained here-in.

# Exhibit 1.0: W270DT - Present and Proposed as a Fill-In for WDUR(AM)

## W270DT

BLFT20190319AAK  
Latitude: 35-58-04.98 N  
Longitude: 078-53-16.97 W  
ERP: 0.12 kW  
Channel: 270  
Frequency: 101.9 MHz  
AMSL Height: 186.0 m  
Elevation: 95.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

## W270DT.P

BLFT20190319AAK  
Latitude: 35-58-04.98 N  
Longitude: 078-53-16.97 W  
ERP: 0.25 kW  
Channel: 270  
Frequency: 101.9 MHz  
AMSL Height: 186.0 m  
Elevation: 91.166 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

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W270DT (270)  
W270DT.P (270)  
WDUR.L

Circle R = 40.0 km

FCC F(50-50) 60.00 dBu (FCC HAAT)  
FCC F(50-50) 60.00 dBu (FCC HAAT)

Durham

W270DT.P  
WDUR.L  
W270DT

Raleigh

Scale 1:500,000

0 7 14 21 km

V-Soft Communications LLC © Micro

Exhibit 2.0 - Proposed Allocation  
Arohi Media LLC

REFERENCE		CH# 270D - 101.9 MHz, Pwr= 0.25 kW DA, HAAT= 79.9 M, COR= 186 M								DISPLAY DATES		
35 58 05.50 N.		Average Protected F(50-50)= 11.57 km								DATA 03-25-24		
78 53 16.00 W.		Standard Directional								SEARCH 03-26-24		
CH	CALL	TYPE	ANT	AZI	DIST	LAT	PWR(kw)	INT(km)	PRO(km)	*IN*	*OUT*	
CITY		STATE		<--	FILE #	LNG	HAAT(M)	COR(M)	LICENSEE	(Overlap	in km)	
270D	W270DT	LIC	DCN	0.0	0.00	35 58 05.50	0.120		---	Reference---		
Durham		NC		96.9	BLFT20190319AAK	78 53 16.00		186	Wdur LLC			
268C	WRAL	LIC	_CN	135.5	45.40	35 40 35.10	98.000	13.8	92.1	20.4	-47.6*	
Raleigh		NC		315.7	0000160016	78 32 07.20	606	697	Wral-Fm, Inc.			
271C0	W3MH	LIC	_CN	290.2	100.52	36 16 33.50	100.000	113.6	77.1	-24.3*	7.9	
Reidsville		NC		109.6	BMLH20010731ACA	79 56 25.10	367	600	Audacy License, LLC, As De			
273A	WKXU	LIC	_CN	335.1	16.61	36 06 13.50	1.500	2.3	30.4	3.6	-14.9*	
Hillsborough		NC		155.1	BLH20101029ACM	78 57 56.00	204	350	New Century Media Group, L			
270C1	WIKS	LIC	_CN	118.5	175.77	35 12 07.50	100.000	171.6	72.1	-6.4	76.1	
New Bern		NC		299.5	BLH19870306KD	77 11 13.80	299	308	Cmg Coastal Carolina, LLC			
270L1	WKRP-LP	LIC	_CN	115.5	32.83	35 50 26.70	0.100			3.8	0.3	
Raleigh		NC		295.7	BLL20151125AGI	78 33 32.10	8	96	Oak City Media, Inc.			
270D	W270AW	APP	_CN	202.4	60.89	35 27 41.00	0.131	41.6	12.2	6.6	5.4	
Sanford		NC		22.2	0000241748	79 08 37.20	520	194	Educational Media Foundati			
270D	W270AW	CP	_CN	202.4	60.89	35 27 41.00	0.131	41.6	12.2	6.6	5.4	
Sanford		NC		22.2	0000210608	79 08 37.20	520	194	Educational Media Foundati			
270A	WKSJ-FM	LIC	ZEN	36.8	108.05	36 44 39.50	6.000	88.0	29.4	8.0	37.8	
South Hill		VA		217.2	BLH20040526ABK	78 09 41.00	96	199	Lakes Media, LLC			
272A	WKJO	LIC	_CN	136.6	59.46	35 34 43.60	2.600	2.4	26.6	45.6	31.7	
Smithfield		NC		316.9	BLH20101029ACW	78 26 09.00	153	221	Fm 102.3 LLC			
270C0	WBAV-FM	LIC	_CN	250.0	230.87	35 13 57.50	100.000	173.7	73.5	44.8	114.6	
Gastonia		NC		68.6	BLH19880129KD	81 16 34.30	301	552	Beasley Media Group Licens			
272D	W272BN	LIC	_CN	206.8	65.59	35 26 28.60	0.027	0.4	6.8	52.6	57.6	
Sanford		NC		26.6	BLFT20070808AAF	79 12 53.10	74	176	Positive Alternative Radio			
269L1	WDFC-LP	LIC	_CN	279.9	84.87	36 05 43.10	0.013			64.7	62.3	
Greensboro		NC		99.3	BLL20160419AAT	79 49 07.00	84	335	Cumc Radio, LLC			
271D	W271BT	LIC	_CN	90.6	90.32	35 57 18.60	0.019	8.5	6.1	69.6	67.1	
Rocky Mount		NC		271.2	BLFT20161128AFP	77 53 02.90		143	Educational Media Foundati			
270L1	NEW	APP	_CN	188.0	121.61	34 53 06.00	0.100			90.2	72.0	
Red Springs		NC		7.9	0000233156	79 04 28.00	30	88	Widu Cares Foundation			
271D	W271DR	LIC	_CN	185.2	101.41	35 03 35.20	0.010	10.8	7.6	77.8	75.0	
Fayetteville		NC		5.2	0000181494	78 59 22.80		240	Colonial Radio Group, Inc.			
273D	W273CD	LIC	_CN	325.6	86.30	36 36 27.40	0.140	0.8	7.9	75.1	76.0	
Danville		VA		145.3	BLFT20130419AAT	79 26 02.00	22	201	Piedmont Broadcasting Corp			
273A	WIOZ-FM	LIC	_CN	210.6	105.32	35 09 04.60	3.400	2.6	27.9	90.0	76.3	
Southern Pines		NC		30.3	BLH19951107KB	79 28 39.10	133	258	Meridian Communications. L			
216C2	WOKD-FM	LIC	DCN	332.8	96.74	36 44 30.40	18.000	185266100	00000000000000000000.0			
									162648100000000000000000.0			
									14.5R	82.2M		
Danville		VA		152.5	BLED20000331ABX	79 23 06.00	142	353	Positive Altenative Radio			
273D	W273DH	LIC	DCN	267.3	102.90	35 55 11.50	0.040	0.1	4.4	90.8	97.2	
High Point		NC		86.7	BLFT20190315AAZ	80 01 46.10		379	Truth Broadcasting Corpora			
273D	W273DV	LIC	_CN	128.7	103.50	35 22 58.00	0.250	1.1	8.0	91.5	94.4	
Goldsboro		NC		309.2	BLFT20190812AAF	77 59 47.80		79	Mount Olive Broadcasting C			
216A	WYBH	LIC	_CN	185.3	101.19	35 03 35.60	0.255	185266100	00000000000000000000.0			
									162648100000000000000000.0			
									9.5R	91.7M		
Fayetteville		NC		5.2	BLED20081008ACL	78 59 23.10	195	256	Bible Broadcasting Network			
272A	WPTM	LIC	_CN	59.6	119.01	36 30 13.50	6.000	2.5	25.8	104.0	91.9	
Roanoke Rapids		NC		240.3	BLH20031023ACJ	77 44 18.90	97	166	Byrne Acquisition Group, L			

Terrain database is USGS 03 SEC , R= 73.215 qualifying spacings or FCC minimum spacings in KM, M= Margin in KM  
In & Out distances between contours are shown at closest points. Reference zone= East Zone, Co to 3rd adjacent.  
All separation margins (if shown) include rounding.  
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, \_= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)  
"\*"affixed to 'IN' or 'OUT' values = site inside restricted contour.  
« = Station meets FCC minimum distance spacing for its class.  
Reference station has protected zone issue: AM tower

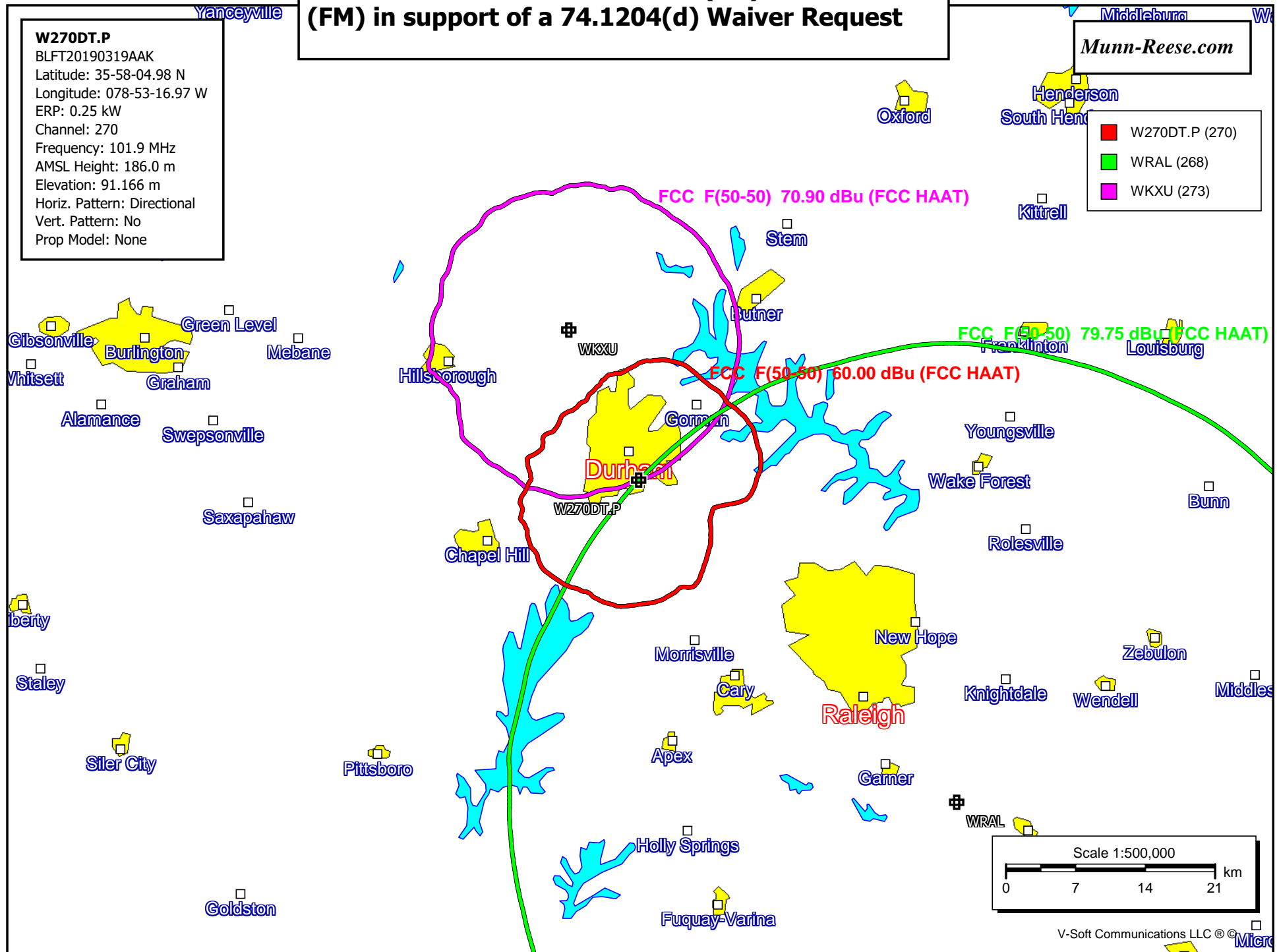
# Exhibit 3.0: W270DT - vs WRAL(FM) and WKXU (FM) in support of a 74.1204(d) Waiver Request

## W270DT.P

BLFT20190319AAK  
Latitude: 35-58-04.98 N  
Longitude: 078-53-16.97 W  
ERP: 0.25 kW  
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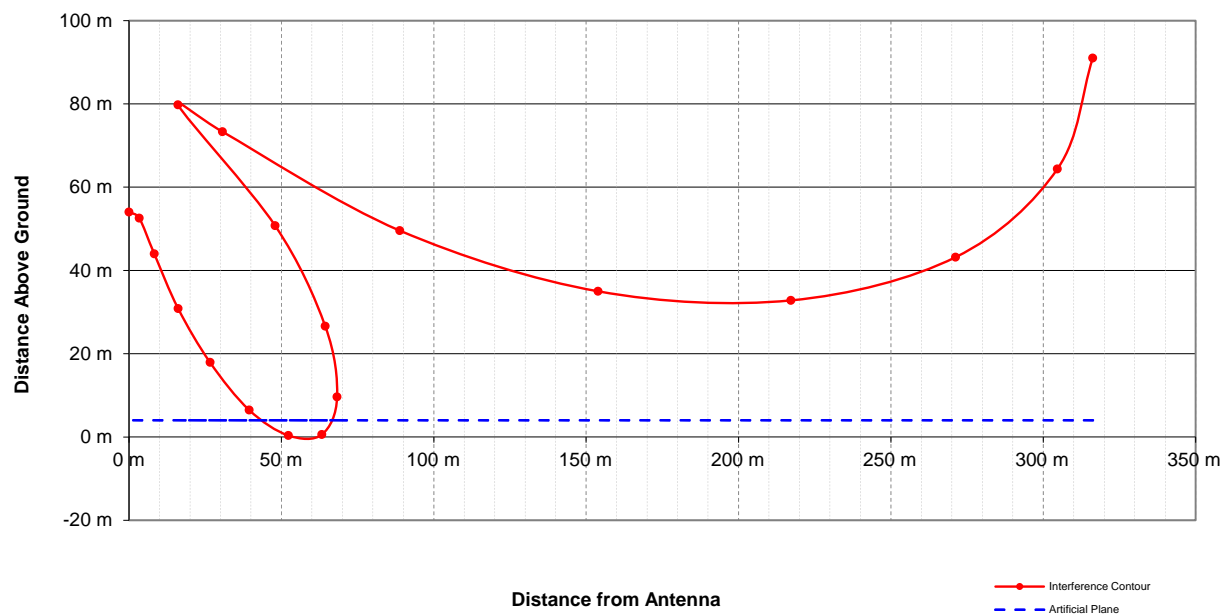
- W270DT.P (270)
- WRAL (268)
- WKXU (273)



**Exhibit 3.1 – WDUR Tower with 90-meter Radius Circle With no Population**







**Proposed Antenna:** Jampro 2 by JCPB  
**Proposed Power:** 0.25 kW  
**Antenna Height AGL:** 91 meters  
**Interference Contour:** 110.90 dBu f(50:10)  
**Artificial Ground Plane Height:** 4 meters  
**Distance (Free Space) Equation:**  $= (10^{((106.92 - [\text{desired dBu}] + [\text{ERP in dBk}]) / 20)) * 1000}$   
**Field Strength (dBu) Equation:**  $= 106.92 - (20 * (\text{LOG10}[\text{DistMeters} / 1000])) + [\text{ERP in dBk}]$

Depression Angle	Antenna			Distance from Ant.	Distance	Field Strength	Distance	Field Strength
Below Horizon	Relative Field	ERP in kW	ERP in dBk	to Interference Contour	from Ant. to Artificial Plane	in dBu @ Artificial Plane	from Ant. to Ground Level	in dBu @ Ground Level
0°	1.000	0.250	-6.02	316.21 m	infinite	---	---	---
-5°	0.967	0.234	-6.31	305.77 m	998.21 m	100.62 dBu	1044.11 m	100.23 dBu
-10°	0.871	0.190	-7.22	275.42 m	501.01 m	105.70 dBu	524.05 m	105.31 dBu
-15°	0.711	0.126	-8.98	224.82 m	336.14 m	107.41 dBu	351.60 m	107.02 dBu
-20°	0.518	0.067	-11.73	163.79 m	254.37 m	107.08 dBu	266.07 m	106.69 dBu
-25°	0.310	0.024	-16.19	98.02 m	205.86 m	104.46 dBu	215.32 m	104.06 dBu
-30°	0.112	0.003	-25.04	35.42 m	174.00 m	97.07 dBu	182.00 m	96.68 dBu
-35°	0.062	0.001	-30.17	19.60 m	151.68 m	93.13 dBu	158.65 m	92.74 dBu
-40°	0.198	0.010	-20.09	62.61 m	135.35 m	104.20 dBu	141.57 m	103.81 dBu
-45°	0.288	0.021	-16.83	91.07 m	123.04 m	108.29 dBu	128.69 m	107.90 dBu
-50°	0.336	0.028	-15.49	106.25 m	113.57 m	110.32 dBu	118.79 m	109.93 dBu
-55°	0.349	0.030	-15.16	110.36 m	106.21 m	111.23 dBu	111.09 m	110.84 dBu
-60°	0.331	0.027	-15.62	104.66 m	100.46 m	111.26 dBu	105.08 m	110.87 dBu
-65°	0.295	0.022	-16.62	93.28 m	95.99 m	110.65 dBu	100.41 m	110.26 dBu
-70°	0.246	0.015	-18.20	77.79 m	92.58 m	109.39 dBu	96.84 m	109.00 dBu
-75°	0.197	0.010	-20.13	62.29 m	90.07 m	107.70 dBu	94.21 m	107.31 dBu
-80°	0.151	0.006	-22.44	47.75 m	88.34 m	105.56 dBu	92.40 m	105.17 dBu
-85°	0.122	0.004	-24.29	38.58 m	87.33 m	103.80 dBu	91.35 m	103.41 dBu
-90°	0.117	0.003	-24.66	37.00 m	87.00 m	103.47 dBu	91.00 m	103.08 dBu