

**TECHNICAL ATTACHMENT  
NEW LPFM FOR LOUISVILLE, KY**

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State: KY  
City: LOUISVILLE  
Channel: 224

Antenna Structure Registration: 1267767  
Do you have an FCC Antenna Structure Registration Number?: Y  
Yes/No/Filed with the FAA No

Latitude: 38-11-52.3 N  
Longitude: 85-46-8.9 W  
Structure Type: MTOWER  
Overall Structure Height: 56.4  
Support Structure: 53.3  
Ground Elevation: 124.7

*Antenna Data*

	HORIZONTAL	VERTICAL
Height of Radiation Center Above Ground Level	41.5	41.5
Height of Radiation Center AMSL	(FORM CALCULATES)	
MIn Radiated Power	(FORM CALCULATES)	
Max Radiated Power	(FORM CALCULATES)	

*Antenna Type*

Directional  
Non-Directional X

Directional Antenna

*Technical Certification*

Environmental Effect

\*Would a Commission grant of Authorization for this location be an action which may have a significant environmental effect? See 47 C.F.R. Section 1.1306?

NO

## Interference

Does the applicant certify that the proposed facility complies with engineering requirements...?

NO

## SPACING

23 REFERENCE 38 11 52.30 N. CLASS = L1 DATA 10-16-23  
85 46 08.90 W. Current Spacings to 3rd Adj. SEARCH 12-03-

----- Channel 224 - 92.7 MHz -----

Call	Channel	Location		Azi	Dist	FCC	Margin
WTFX-FM	LIC-N 226A	Clarksville	IN	309.0	15.23	28.5	-13.3
W222CD	LIC 222D	Louisville	KY	186.2	12.93	20.5	-7.6
WXXU-FM	LIC 224A	Austin	IN	358.2	69.34	66.5	2.8
WBKR	LIC 223C	Owensboro	KY	240.2	130.60	119.5	11.1
W223DK	LIC-D 223D	Louisville	KY	21.5	33.93	20.5	13.4
WVLK-FM	LIC 225C1	Lexington	KY	98.0	121.08	99.5	21.6
W225BS	LIC 225D	Elizabethtown	KY	191.8	51.35	27.5	23.9
WOFX-FM	LIC-D 223B	Cincinnati	OH	46.7	150.21	96.5	53.7
W221EG	LIC 221D	Hawesville	KY	250.4	88.90	20.5	68.4
WHVE	LIC-Z 224A	Russell Springs	KY	157.0	134.93	66.5	68.4
WBVX	LIC-N 221C2	Carlisle	KY	90.0	122.55	52.5	70.1
WTTS	LIC 222B	Trafalgar	IN	346.4	138.25	66.5	71.8

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All separation margins include rounding



## SECOND ADJACENT CHANNEL WAIVER REQUEST

Applicant respectfully requests a "second adjacent channel waiver" with regards to Section 47 C.F.R. Section 73.807 of the FCC rules based upon the "Living Way" precedent (Living Way Ministries, Inc., Memorandum Opinion and Order, 17 FCC Red 17054, 17056, ¶ 5 (2002), recon. denied 23 FCC Red 15070 (2008)). This will be accomplished by using Free Space methodology of calculation.

The second adjacent channels are (with signal strength at the proposed site):

WTFX-FM CH226A 74.3 dBu  
W222CD CH222D 65.7 dBu

Using U/D methodology, interference will occur when W222CD's signal strength's interfering signal exceeds the desired signal by 40 dBu. So the area of predicted interference would then be bounded by the 105.7 dBu contour.

The distance to this contour, using free space method:

$$D = (7.01 \cdot P^{1/2}) / E,$$

where P is power (watts), E is field strength (v/m), and D is distance to contour (meters):

$$P = 50 \text{ w}, E = 105.7 \text{ dBu } D = 258.6 \text{ meters}$$

However, the field strength of the proposed LPFM's antenna system falls quickly at depression angles below the horizon. Using elevation pattern data provided by Scala for a FMVMP antenna setup (3 bay 0.75 wave spaced) the distance to the 105.7 dBu contour at various depression angles is tabulated below. The data shows that the lowest point at which the signal strength rises to 105.7 dBu is 35.6 meters below the center of radiation of the antenna system, or 5.9 meters above the ground. Therefore, this is sufficient clearance from the population at ground level and the interference area encompasses zero population. The table below shows that the lowest elevation point of the 105.7 F(50,10) interfering contour is 5.9 meters above ground.

Due to zero population within this radiation radius, this meets the "Living Way" Criteria to qualify for a Waiver of 47 C.F.R. Section 73.807.

Thus, the applicant requests a second adjacent waiver based upon evidence no interference is proposed.

MAX ERP	DEPRESSION ANGLE	RELATIVE FIELD	dB FROM RELATIVE	ERP	ANGULAR DISTANCE TO 105.7 dBu CONTOUR	VERTICAL DISTANCE (below antenna)	HORIZONTAL DISTANCE TO 105.7dBu CONTOUR	CLEARANCE OF CONTOUR ABOVE GROUND
50	-90	0.02	-33.979	0.02	5.1	5	0	36.5
50	-89	0.013	-37.721	0.01	3.3	3.2	0	38.3
50	-88	0.008	-40.000	0.01	2.5	2.4	0	39.1
50	-87	0.008	-40.000	0.01	2.5	2.4	0.1	39.1
50	-86	0.008	-40.000	0.01	2.5	2.4	0.1	39.1
50	-85	0.015	-36.478	0.01	3.8	3.7	0.3	37.8
50	-84	0.022	-33.152	0.02	5.6	5.5	0.5	36
50	-83	0.029	-30.752	0.04	7.4	7.3	0.9	34.2
50	-82	0.036	-28.874	0.06	9.2	9.1	1.2	32.4
50	-81	0.043	-27.331	0.09	11	10.8	1.7	30.7
50	-80	0.05	-26.021	0.13	12.8	12.6	2.2	28.9
50	-79	0.057	-24.883	0.16	14.6	14.3	2.7	27.2
50	-78	0.063	-24.013	0.20	16.2	15.8	3.3	25.7
50	-77	0.07	-23.098	0.25	18	17.5	4	24
50	-76	0.076	-22.384	0.29	19.5	18.9	4.7	22.6
50	-75	0.082	-21.724	0.34	21	20.2	5.4	21.3
50	-74	0.088	-21.110	0.39	22.6	21.7	6.2	19.8
50	-73	0.093	-20.630	0.43	23.9	22.8	7	18.7
50	-72	0.098	-20.175	0.48	25.2	23.9	7.8	17.6
50	-71	0.103	-19.743	0.53	26.4	24.9	8.6	16.6
50	-70	0.107	-19.412	0.57	27.5	25.8	9.4	15.7
50	-69	0.111	-19.094	0.62	28.5	26.6	10.2	14.9
50	-68	0.113	-18.938	0.64	29	26.8	10.8	14.7
50	-67	0.116	-18.711	0.67	29.8	27.4	11.6	14.1
50	-66	0.117	-18.636	0.68	30	27.3	12.2	14.2
50	-65	0.118	-18.562	0.70	30.3	27.4	12.8	14.1
50	-64	0.118	-18.562	0.70	30.3	27.2	13.2	14.3

50	-63	0.117	-18.636	0.68	30	26.7	13.6	14.8
50	-62	0.115	-18.786	0.66	29.5	26	13.8	15.5
50	-61	0.112	-19.016	0.63	28.8	25.1	13.9	16.4
50	-60	0.108	-19.332	0.58	27.7	23.9	13.8	17.6
50	-59	0.103	-19.743	0.53	26.4	22.6	13.6	18.9
50	-58	0.096	-20.355	0.46	24.6	20.8	13	20.7
50	-57	0.088	-21.110	0.39	22.6	18.9	12.3	22.6
50	-56	0.079	-22.047	0.31	20.3	16.8	11.3	24.7
50	-55	0.069	-23.223	0.24	17.7	14.4	10.1	27.1
50	-54	0.058	-24.731	0.17	14.9	12	8.7	29.5
50	-53	0.045	-26.936	0.10	11.5	9.1	6.9	32.4
50	-52	0.031	-30.173	0.05	7.9	6.2	4.8	35.3
50	-51	0.016	-35.918	0.01	4.1	3.1	2.5	38.4
50	-50	0.01	-40.000	0.01	2.5	1.9	1.6	39.6
50	-49	0.018	-34.895	0.02	4.6	3.4	3	38.1
50	-48	0.036	-28.874	0.06	9.2	6.8	6.1	34.7
50	-47	0.054	-25.352	0.15	13.8	10	9.4	31.5
50	-46	0.073	-22.734	0.27	18.7	13.4	12.9	28.1
50	-45	0.093	-20.630	0.43	23.9	16.8	16.9	24.7
50	-44	0.112	-19.016	0.63	28.8	19.9	20.7	21.6
50	-43	0.132	-17.589	0.87	33.9	23.1	24.8	18.4
50	-42	0.15	-16.478	1.13	38.5	25.7	28.6	15.8
50	-41	0.169	-15.442	1.43	43.4	28.4	32.7	13.1
50	-40	0.186	-14.610	1.73	47.8	30.7	36.6	10.8
50	-39	0.201	-13.936	2.02	51.6	32.4	40.1	9.1
50	-38	0.215	-13.351	2.31	55.2	33.9	43.5	7.6
50	-37	0.227	-12.879	2.58	58.3	35	46.5	6.5
50	-36	0.236	-12.542	2.78	60.6	35.6	49	5.9
50	-35	0.242	-12.324	2.93	62.2	35.6	50.9	5.9
50	-34	0.246	-12.181	3.03	63.2	35.3	52.4	6.2
50	-33	0.246	-12.181	3.03	63.2	34.4	53	7.1

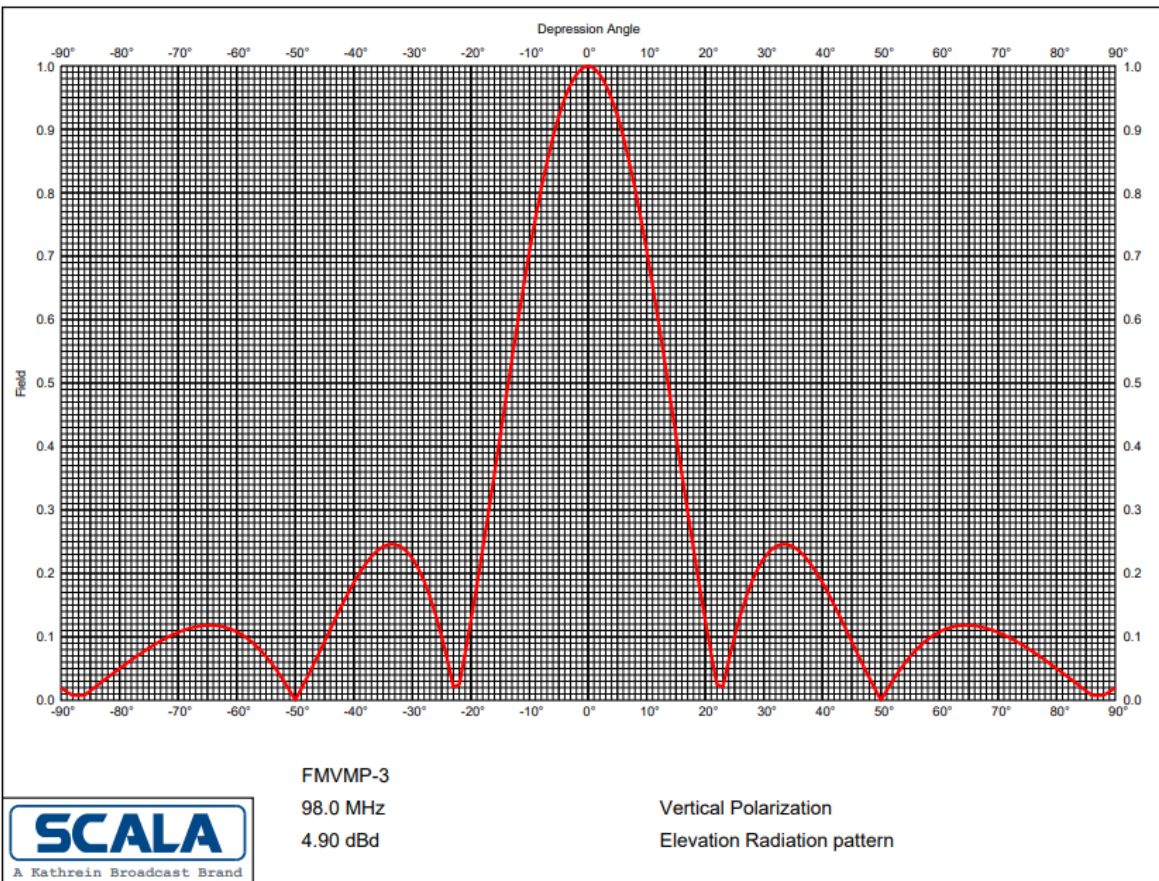
50	-32	0.242	-12.324	2.93	62.2	32.9	52.7	8.6
50	-31	0.235	-12.579	2.76	60.4	31	51.7	10.5
50	-30	0.224	-12.995	2.51	57.6	28.7	49.8	12.8
50	-29	0.208	-13.639	2.16	53.4	25.8	46.7	15.7
50	-28	0.188	-14.517	1.77	48.3	22.6	42.6	18.9
50	-27	0.163	-15.756	1.33	41.9	19	37.3	22.5
50	-26	0.134	-17.458	0.90	34.4	15	30.9	26.5
50	-25	0.1	-20.000	0.50	25.7	10.8	23.2	30.7
50	-24	0.063	-24.013	0.20	16.2	6.5	14.8	35
50	-23	0.021	-33.556	0.02	5.4	2.1	4.9	39.4
50	-22	0.025	-32.041	0.03	6.4	2.3	5.9	39.2
50	-21	0.074	-22.615	0.27	19	6.8	17.7	34.7
50	-20	0.126	-17.993	0.79	32.4	11	30.4	30.5
50	-19	0.181	-14.846	1.64	46.5	15.1	43.9	26.4
50	-18	0.238	-12.468	2.83	61.2	18.9	58.2	22.6
50	-17	0.297	-10.545	4.41	76.3	22.2	72.9	19.3
50	-16	0.357	-8.947	6.37	91.8	25.2	88.2	16.3
50	-15	0.418	-7.576	8.74	107.4	27.7	103.7	13.8
50	-14	0.478	-6.411	11.42	122.9	29.7	119.2	11.8
50	-13	0.538	-5.384	14.47	138.3	31	134.7	10.5
50	-12	0.597	-4.481	17.82	153.5	31.8	150.1	9.7
50	-11	0.654	-3.688	21.39	168.1	32	165	9.5
50	-10	0.708	-2.999	25.06	182	31.5	179.2	10
50	-9	0.759	-2.395	28.80	195.1	30.5	192.7	11
50	-8	0.807	-1.863	32.56	207.5	28.8	205.4	12.7
50	-7	0.85	-1.412	36.13	218.5	26.6	216.8	14.9
50	-6	0.888	-1.032	39.43	228.3	23.8	227	17.7
50	-5	0.921	-0.715	42.41	236.8	20.6	235.8	20.9
50	-4	0.949	-0.455	45.03	244	17	243.4	24.5
50	-3	0.971	-0.256	47.14	249.7	13	249.3	28.5
50	-2	0.987	-0.114	48.71	253.8	8.8	253.6	32.7

50	-1	0.996	-0.035	49.60	256.1	4.4	256	37.1
50	0	1	0.000	50.00	257.1	0	257.1	41.5
50	1	0.996	-0.035	49.60	256.1	4.4	256	37.1
50	2	0.987	-0.114	48.71	253.8	8.8	253.6	32.7
50	3	0.971	-0.256	47.14	249.7	13	249.3	28.5
50	4	0.949	-0.455	45.03	244	17	243.4	24.5
50	5	0.921	-0.715	42.41	236.8	20.6	235.8	20.9
50	6	0.888	-1.032	39.43	228.3	23.8	227	17.7
50	7	0.85	-1.412	36.13	218.5	26.6	216.8	14.9
50	8	0.807	-1.863	32.56	207.5	28.8	205.4	12.7
50	9	0.759	-2.395	28.80	195.1	30.5	192.7	11
50	10	0.708	-2.999	25.06	182	31.5	179.2	10
50	11	0.654	-3.688	21.39	168.1	32	165	9.5
50	12	0.597	-4.481	17.82	153.5	31.8	150.1	9.7
50	13	0.538	-5.384	14.47	138.3	31	134.7	10.5
50	14	0.478	-6.411	11.42	122.9	29.7	119.2	11.8
50	15	0.418	-7.576	8.74	107.4	27.7	103.7	13.8
50	16	0.357	-8.947	6.37	91.8	25.2	88.2	16.3
50	17	0.297	-10.545	4.41	76.3	22.2	72.9	19.3
50	18	0.238	-12.468	2.83	61.2	18.9	58.2	22.6
50	19	0.181	-14.846	1.64	46.5	15.1	43.9	26.4
50	20	0.126	-17.993	0.79	32.4	11	30.4	30.5
50	21	0.074	-22.615	0.27	19	6.8	17.7	34.7
50	22	0.025	-32.041	0.03	6.4	2.3	5.9	39.2
50	23	0.021	-33.556	0.02	5.4	2.1	4.9	39.4
50	24	0.063	-24.013	0.20	16.2	6.5	14.8	35
50	25	0.1	-20.000	0.50	25.7	10.8	23.2	30.7
50	26	0.134	-17.458	0.90	34.4	15	30.9	26.5
50	27	0.163	-15.756	1.33	41.9	19	37.3	22.5
50	28	0.188	-14.517	1.77	48.3	22.6	42.6	18.9
50	29	0.208	-13.639	2.16	53.4	25.8	46.7	15.7



50	30	0.224	-12.995	2.51	57.6	28.7	49.8	12.8
50	31	0.235	-12.579	2.76	60.4	31	51.7	10.5
50	32	0.242	-12.324	2.93	62.2	32.9	52.7	8.6
50	33	0.246	-12.181	3.03	63.2	34.4	53	7.1
50	34	0.246	-12.181	3.03	63.2	35.3	52.4	6.2
50	35	0.242	-12.324	2.93	62.2	35.6	50.9	5.9
50	36	0.236	-12.542	2.78	60.6	35.6	49	5.9
50	37	0.227	-12.879	2.58	58.3	35	46.5	6.5
50	38	0.215	-13.351	2.31	55.2	33.9	43.5	7.6
50	39	0.201	-13.936	2.02	51.6	32.4	40.1	9.1
50	40	0.186	-14.610	1.73	47.8	30.7	36.6	10.8
50	41	0.169	-15.442	1.43	43.4	28.4	32.7	13.1
50	42	0.15	-16.478	1.13	38.5	25.7	28.6	15.8
50	43	0.132	-17.589	0.87	33.9	23.1	24.8	18.4
50	44	0.112	-19.016	0.63	28.8	19.9	20.7	21.6
50	45	0.093	-20.630	0.43	23.9	16.8	16.9	24.7
50	46	0.073	-22.734	0.27	18.7	13.4	12.9	28.1
50	47	0.054	-25.352	0.15	13.8	10	9.4	31.5
50	48	0.036	-28.874	0.06	9.2	6.8	6.1	34.7
50	49	0.018	-34.895	0.02	4.6	3.4	3	38.1
50	50	0.01	-40.000	0.01	2.5	1.9	1.6	39.6
50	51	0.016	-35.918	0.01	4.1	3.1	2.5	38.4
50	52	0.031	-30.173	0.05	7.9	6.2	4.8	35.3
50	53	0.045	-26.936	0.10	11.5	9.1	6.9	32.4
50	54	0.058	-24.731	0.17	14.9	12	8.7	29.5
50	55	0.069	-23.223	0.24	17.7	14.4	10.1	27.1
50	56	0.079	-22.047	0.31	20.3	16.8	11.3	24.7
50	57	0.088	-21.110	0.39	22.6	18.9	12.3	22.6
50	58	0.096	-20.355	0.46	24.6	20.8	13	20.7
50	59	0.103	-19.743	0.53	26.4	22.6	13.6	18.9
50	60	0.108	-19.332	0.58	27.7	23.9	13.8	17.6

50	61	0.112	-19.016	0.63	28.8	25.1	13.9	16.4
50	62	0.115	-18.786	0.66	29.5	26	13.8	15.5
50	63	0.117	-18.636	0.68	30	26.7	13.6	14.8
50	64	0.118	-18.562	0.70	30.3	27.2	13.2	14.3
50	65	0.118	-18.562	0.70	30.3	27.4	12.8	14.1
50	66	0.117	-18.636	0.68	30	27.3	12.2	14.2
50	67	0.116	-18.711	0.67	29.8	27.4	11.6	14.1
50	68	0.113	-18.938	0.64	29	26.8	10.8	14.7
50	69	0.111	-19.094	0.62	28.5	26.6	10.2	14.9
50	70	0.107	-19.412	0.57	27.5	25.8	9.4	15.7
50	71	0.103	-19.743	0.53	26.4	24.9	8.6	16.6
50	72	0.098	-20.175	0.48	25.2	23.9	7.8	17.6
50	73	0.093	-20.630	0.43	23.9	22.8	7	18.7
50	74	0.088	-21.110	0.39	22.6	21.7	6.2	19.8
50	75	0.082	-21.724	0.34	21	20.2	5.4	21.3
50	76	0.076	-22.384	0.29	19.5	18.9	4.7	22.6
50	77	0.07	-23.098	0.25	18	17.5	4	24
50	78	0.063	-24.013	0.20	16.2	15.8	3.3	25.7
50	79	0.057	-24.883	0.16	14.6	14.3	2.7	27.2
50	80	0.05	-26.021	0.13	12.8	12.6	2.2	28.9
50	81	0.043	-27.331	0.09	11	10.8	1.7	30.7
50	82	0.036	-28.874	0.06	9.2	9.1	1.2	32.4
50	83	0.029	-30.752	0.04	7.4	7.3	0.9	34.2
50	84	0.022	-33.152	0.02	5.6	5.5	0.5	36
50	85	0.015	-36.478	0.01	3.8	3.7	0.3	37.8
50	86	0.01	-40.000	0.01	2.5	2.4	0.1	39.1
50	87	0.01	-40.000	0.01	2.5	2.4	0.1	39.1
50	88	0.01	-40.000	0.01	2.5	2.4	0	39.1
50	89	0.013	-37.721	0.01	3.3	3.2	0	38.3
50	90	0.02	-33.979	0.02	5.1	5	0	36.5



FMVMP-3 98 MHz 4.9

dBd

DATA FROM SCALA

Vertical polarization

Vertical radiation pattern

Angle,Field

	-44,0.112	8,0.807
	-43,0.132	9,0.759
	-42,0.150	10,0.709
	-41,0.168	11,0.654
	-40,0.186	12,0.597
	-39,0.201	13,0.538
-90,0.020	-38,0.215	14,0.478
-89,0.013	-37,0.226	15,0.417
-88,0.008	-36,0.236	16,0.357
-87,0.008	-35,0.242	17,0.297
-86,0.008	-34,0.246	18,0.238
-85,0.015	-33,0.246	19,0.181
-84,0.022	-32,0.242	20,0.126
-83,0.029	-31,0.235	21,0.074
-82,0.036	-30,0.224	22,0.025
-81,0.043	-29,0.208	23,0.021
-80,0.050	-28,0.187	24,0.063
-79,0.057	-27,0.163	25,0.100
-78,0.063	-26,0.134	26,0.134
-77,0.070	-25,0.100	27,0.163
-76,0.076	-24,0.063	28,0.187
-75,0.082	-23,0.021	29,0.208
-74,0.088	-22,0.025	30,0.224
-73,0.093	-21,0.074	31,0.235
-72,0.098	-20,0.126	32,0.242
-71,0.103	-19,0.181	33,0.246
-70,0.107	-18,0.238	34,0.246
-69,0.111	-17,0.297	35,0.242
-68,0.114	-16,0.357	36,0.236
-67,0.116	-15,0.417	37,0.226
-66,0.117	-14,0.478	38,0.215
-65,0.118	-13,0.538	39,0.201
-64,0.118	-12,0.597	40,0.186
-63,0.117	-11,0.654	41,0.168
-62,0.115	-10,0.709	42,0.150
-61,0.112	-9,0.759	43,0.132
-60,0.108	-8,0.807	44,0.112
-59,0.103	-7,0.849	45,0.093
-58,0.096	-6,0.888	46,0.073
-57,0.088	-5,0.920	47,0.054
-56,0.079	-4,0.948	48,0.036
-55,0.069	-3,0.971	49,0.018
-54,0.058	-2,0.986	50,0.001
-53,0.045	-1,0.997	51,0.016
-52,0.031	0,1.000	52,0.031
-51,0.016	1,0.997	53,0.045
-50,0.001	2,0.986	54,0.058
-49,0.018	3,0.971	55,0.069
-48,0.036	4,0.948	56,0.079
-47,0.054	5,0.922	57,0.088
-46,0.073	6,0.888	58,0.096
-45,0.093	7,0.849	59,0.103

60,0.108  
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87,0.008  
88,0.008  
89,0.013  
90,0.020