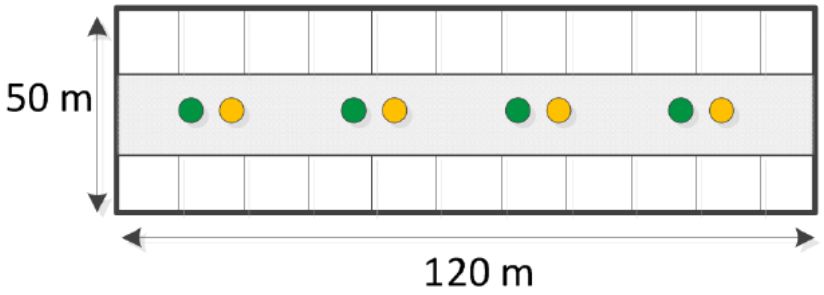
Energy Detection for LAA

❖ Simulation setting

- ✓ 4 APs (green) and 4 eNBs (yellow) are equally spaced [1]



- ✓ Transmit power: 18 dBm, with path loss, shadowing and Rayleigh fading
- ✓ FTP traffic with load rate of 0.5
- ✓ WiFi: CCACS = -82 dBm, CCAED = -62 dBm; LAA: CCAED = -65/-70/-75 dBm
- ✓ $q\_WiFi = [15,63]$, $q\_LAA = [15,63]$

Energy Detection for LAA

❖LAA CCAED: -65 dBm

	WiFi				LAA			
M=8	0.3251	0.1653	0.2275	0.2755	0.3233	0.3217	0.3152	0.3303

❖LLA CCAED: -70 dBm

	WiFi				LAA			
M=8	0.3259	0.2107	0.2164	0.2747	0.2813	0.2410	0.2699	0.3031

❖LLA CCAED: -75 dBm

	WiFi				LAA			
M=8	0.3179	0.2070	0.2271	0.2893	0.2767	0.1851	0.1139	0.2854

Energy Detection for LAA

- ✓ The nodes in the margin have more opportunities to access the channel than the nodes in the middle.
- ✓ Decreasing the LAA CCAED will improve the performance of WiFi, and decrease the performance of LAA.

Energy detection for LAA

❖ LAA CCAED: -65 dBm

✓ Radius in average

WiFi		LAA	
1	2,3	2	1
3	1,4,5	4	3
5	3,6,7	6	5
7	5,8	8	7

✓ Block times

WiFi		LAA	
1	2	2	1
3	3	4	1
5	3	6	1
7	2	8	1

❖ LAA CCAED: -70 dBm

✓ Radius in average

WiFi		LAA	
1	2,3	2	1
3	1,2,4,5	4	3
5	3,4,6,7	6	5
7	5,6,8	8	7

✓ Block times

WiFi		LAA	
1	2	2	2
3	3	4	2
5	3	6	2
7	2	8	1

Energy detection for LAA

❖ LAA CCAED: -75 dBm

✓ Radius in average

WiFi		LAA	
1	2,3,4	2	1,4
3	1,2,4,5,6	4	2,3,6
5	3,4,6,7,8	6	4,5,8
7	5,6,8	8	6,7

✓ Block times

WiFi		LAA	
1	2	2	3
3	3	4	5
5	3	6	5
7	2	8	3

➢ This analysis matches the simulation results pretty well:

✓ From -65 to -70 dBm, the first three LAA nodes become worse;

✓ For -75 dBm, all LAA nodes' performance decreases.