Fixed Service-5G Coexistence at 70 GHz/80 GHz

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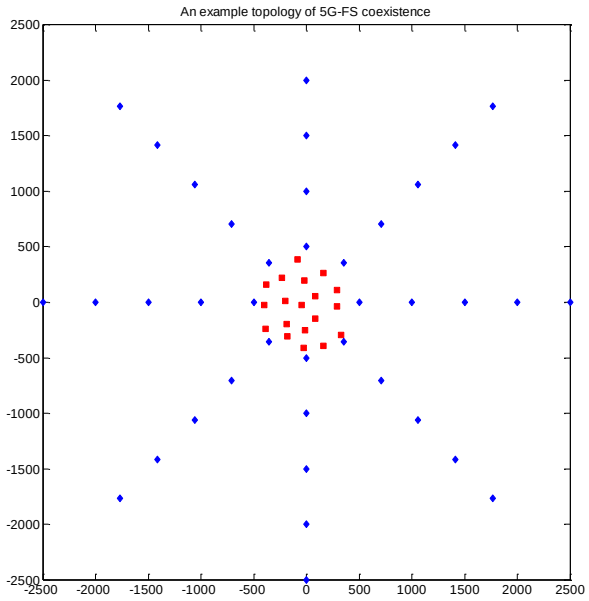
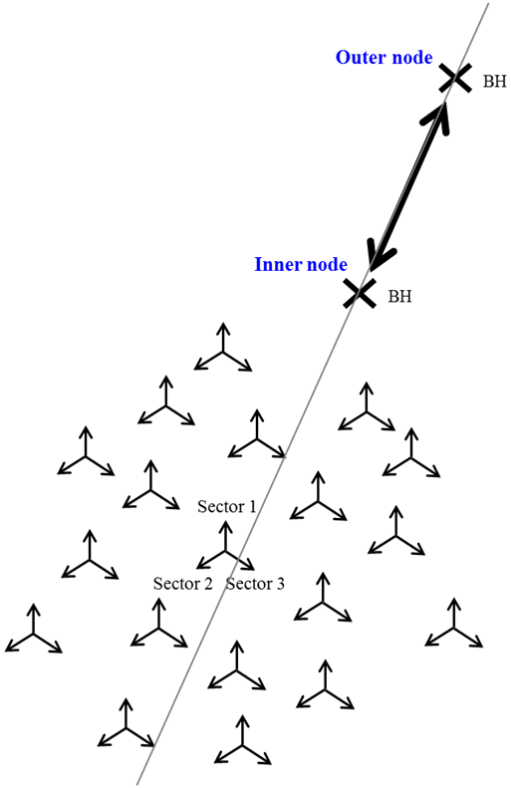
Geometry

Fixed links surrounding 5G



Orientation of Fixed link and 5G sectors



Parameters

Parameter	Value
Path loss	
Carrier frequency	73.5 GHz
Path loss model	UMa (Urban Macro) [4]
5G (AP)	
Number of antennas	16 × 16
EIRP	{72, 62, 57} dBm/GHz
Bandwidth	1 GHz
Temperature	290 K
Noise figure	7 dB
Antenna height	10 m
5G (UE)	
Number of antennas	4 × 4
EIRP	43 dBm/GHz
Bandwidth	1 GHz
Temperature	290 K
Noise figure	9 dB
Antenna height	1.5 m
Fixed link	
Tx power	19 dBm
Antenna gain	{50, 43} dBi
Bandwidth	1 GHz
Temperature	290 K
Noise figure	5 dB
Antenna height	25 m

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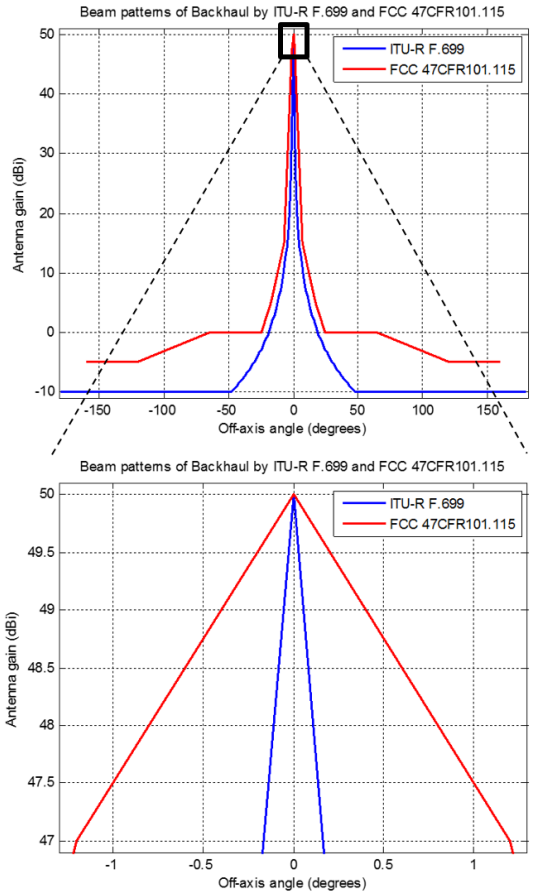
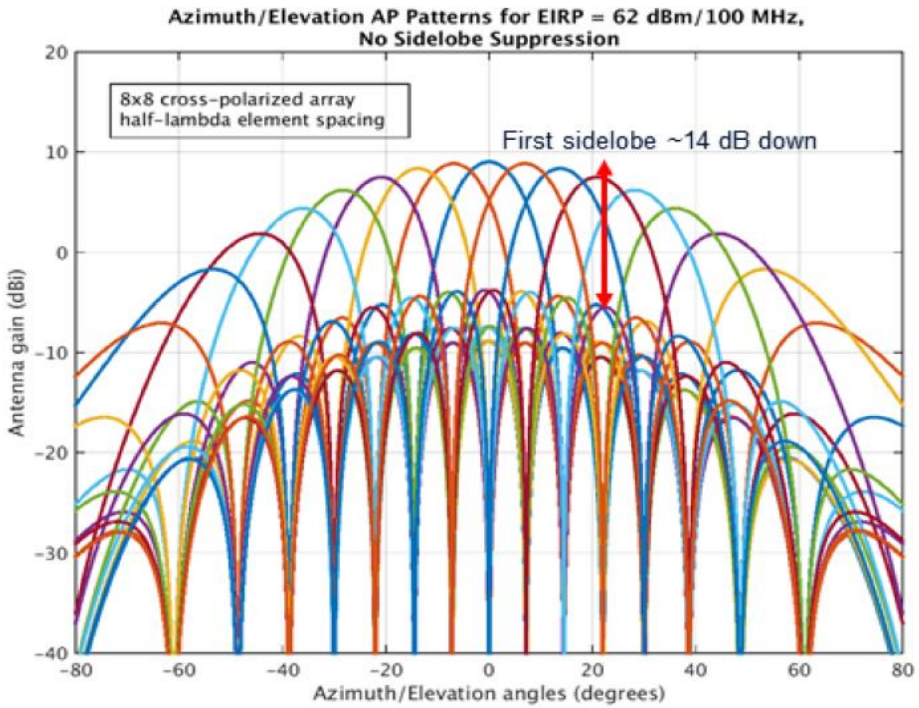
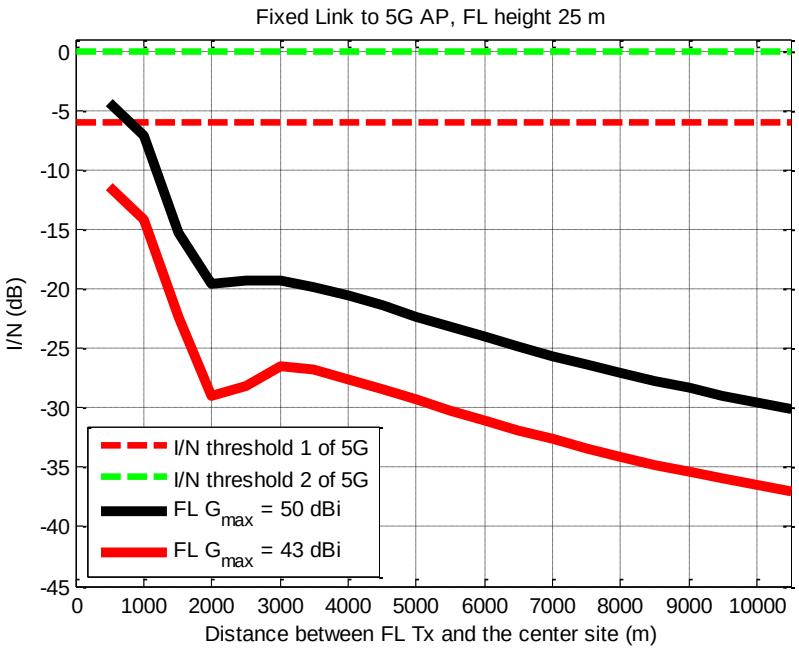
Antenna beam patterns for Fixed link



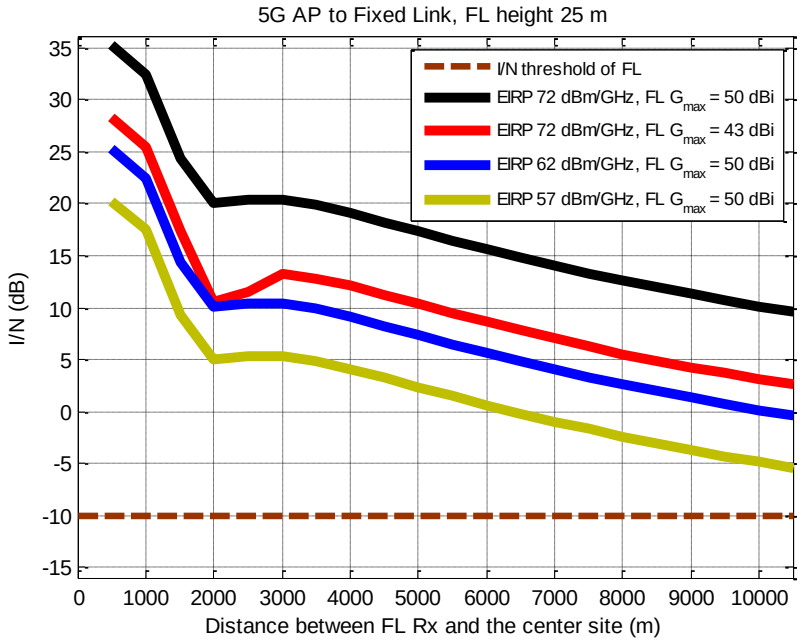
Example of antenna beam pattern of a 5G AP



Results



Fixed Link-to-5G AP interference



5G AP-to-Fixed Link interference

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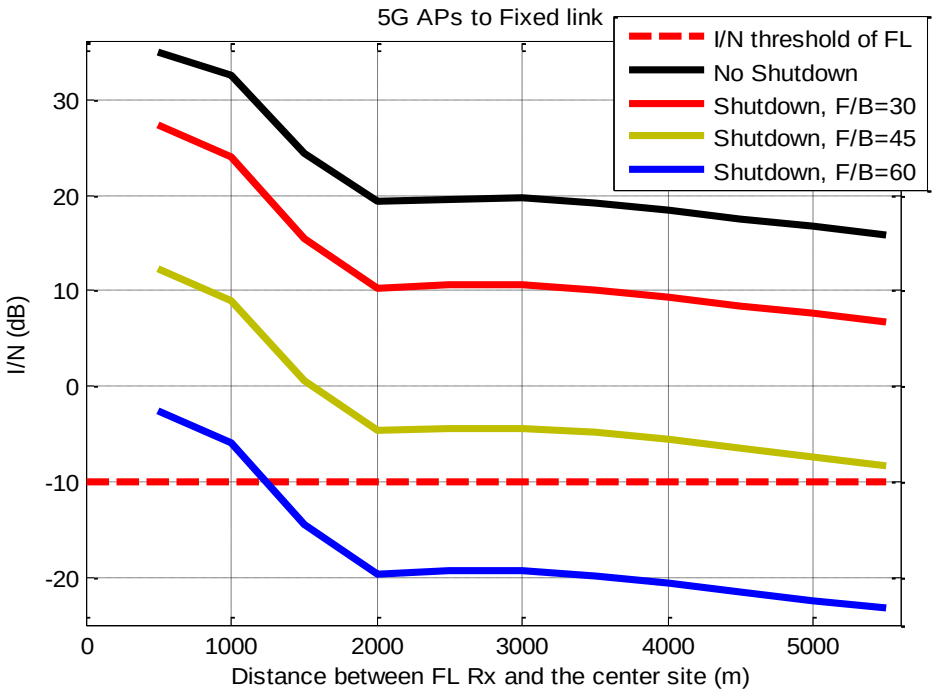
Mitigation of 5G AP-to-Fixed link Interference (1/2)

- 5G APs calculate or learn the offending beams and then defer transmission on only a subset of beams effectively notching small slices of the coverage area in azimuth and elevation. The end result would leave the consumer better served as ubiquitous street level could still achieved by providing signal from an adjacent AP serving the user from a different angle.
- One question is then how would a mobile base station identify or learn of offending beams. Two possible methods could be used to achieve this goal:
  - The database of victim node receive antenna angle, antenna gain and noise margin could be provided to the mobile base station; or
  - A mobile compatible probe receiver could be co-located with the victim nodes within the coverage area detecting and identifying offending beams.

Mitigation of 5G AP-to-Fixed link Interference (2/2)

Shutting down the 5G AP beam(s) responsible for interference at the fixed nodes



Summary

- Interference from 5G AP into Fixed Link could potentially be an issue.

- Effective Mitigation Techniques like shutting down the 5G AP beam(s) responsible for interference at the fixed node were investigated.

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