Channel Measurements in Corridors for TGac

Name	Affiliations	Address	Phone	email
Byung-Jae Kwak	ETRI	138 Gajeongno, Yuseong-gu, Daejeon, 305-700, Korea	+82-42-860-6618	bjkwak@etri.re.kr
Jae Joon Park	ETRI	138 Gajeongno, Yuseong-gu, Daejeon, 305-700, Korea	+82-42-860-3958	jjpark@etri.re.kr
Myung Don Kim	ETRI	138 Gajeongno, Yuseong-gu, Daejeon, 305-700, Korea	+82-42-860-6178	mdkim@etri.re.kr
Minho Cheong	ETRI	138 Gajeongno, Yuseong-gu, Daejeon, 305-700, Korea	+82-42-860-5635	minho@etri.re.kr
Hyun Kyu Chung	ETRI	138 Gajeongno, Yuseong-gu, Daejeon, 305-700, Korea	+82-42-860-6140	hkchung@etri.re.kr
Sok-Kyu Lee	ETRI	138 Gajeongno, Yuseong-gu, Daejeon, 305-700, Korea	+82-42-860-5919	sk-lee@etri.re.kr

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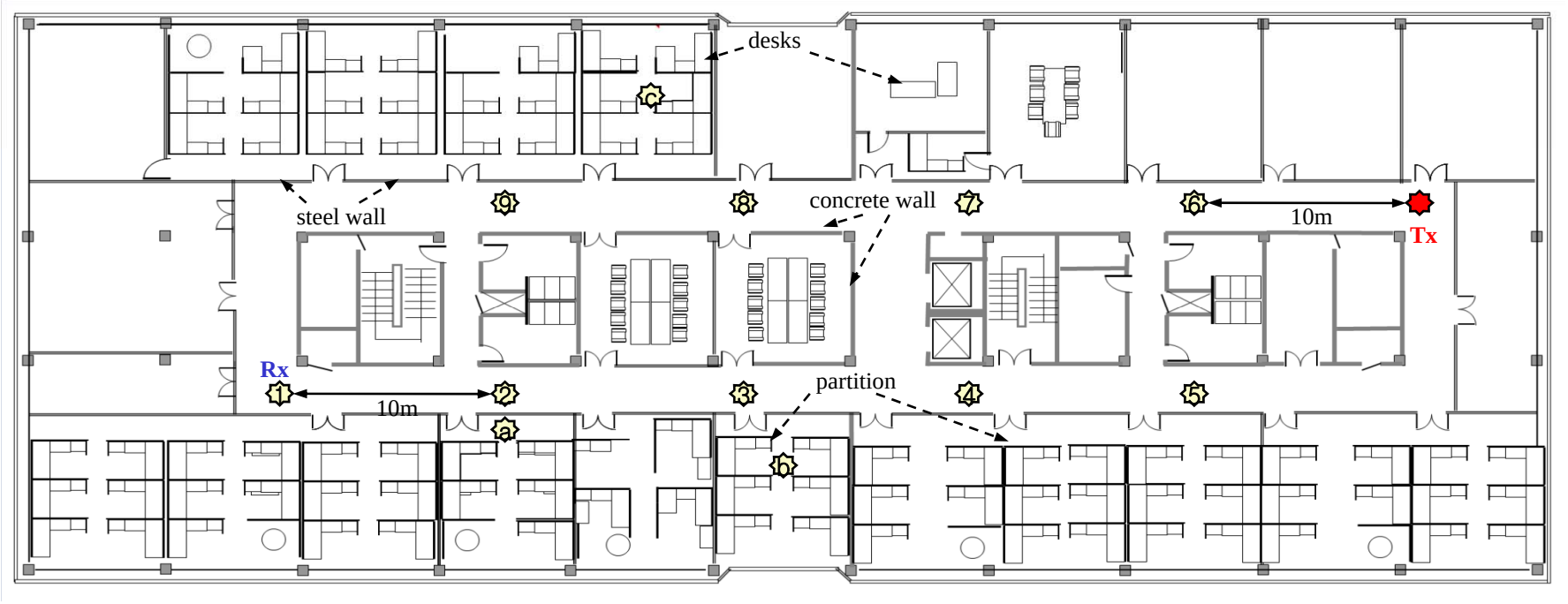
Measurement Campaigns

- 1st Channel measurements
  - Measurement site
    - Bldg. #11, ETRI: metal wall, closed ended
  - Antenna configuration
    - Uniform Linear Array Antenna: 8x8
    - 4 LOS, 8 NLOS
- 2nd Channel measurements
  - Measurement site
    - Bldg. #1, ETRI: concrete walls with metal doors, open ended
  - Antenna configurations
    - Uniform Linear Array Antenna: 8x8, 4x4, 1x1
    - 6 LOS, 6 NLOS
- 100 MHz BW at 5.25 GHz

Measurement Site 1 (1/2)

- LOS: 6, 7, 8, 9
- NLOS: 1, 2, 3, 4, 5, a, b, c



Measurement Site 1 (2/2)

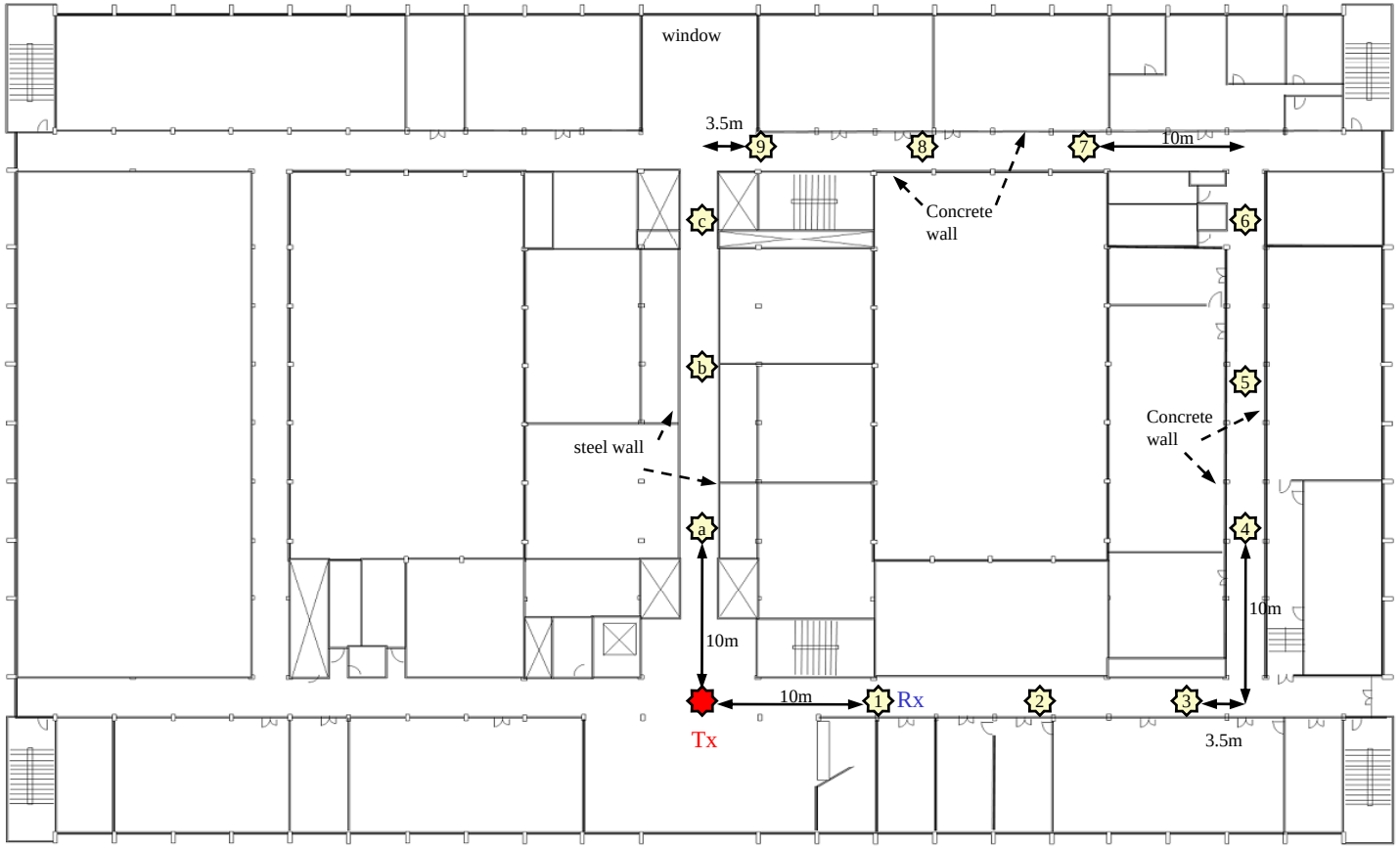
- Tx antenna height = 2m, Rx antenna height = 1m
- Two independent channel measurements at each location (Rx rotated by 90°)

Parallel to Tx antenna

Perpendicular to Tx antenna

Measurement Site 2 (1/2)

- LOS: 1, 2, 3, a, b, c
- NLOS: 4, 5, 6, 7, 8, 9



Measurement Site 2 (2/2)

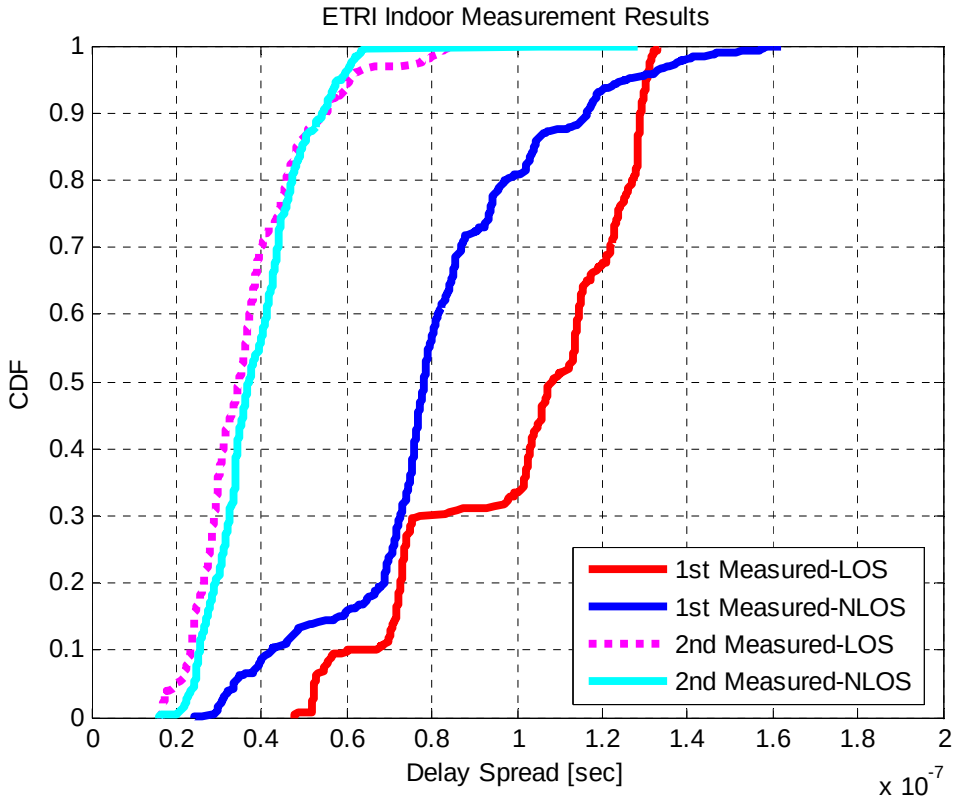
- Tx antenna height = 2m, Rx antenna height = 1m
- Two independent channel measurements at each location (Rx rotated 90°)

Parallel to Tx antenna(#1)

Perpendicular to Tx antenna(#a)

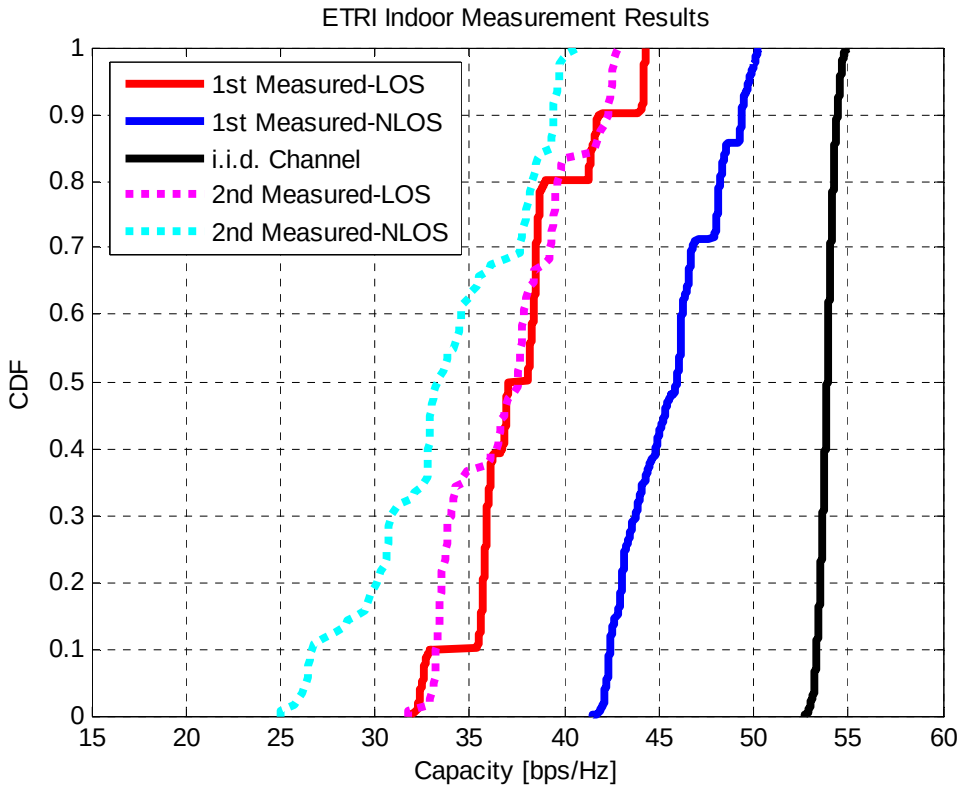
Measurement Result: Delay Spread

- 1st measurement:
  - NLOS: about 80 nsec rms DS; LOS: 110 nsec rms DS
- 2nd measurement: about 35 nsec rms DS



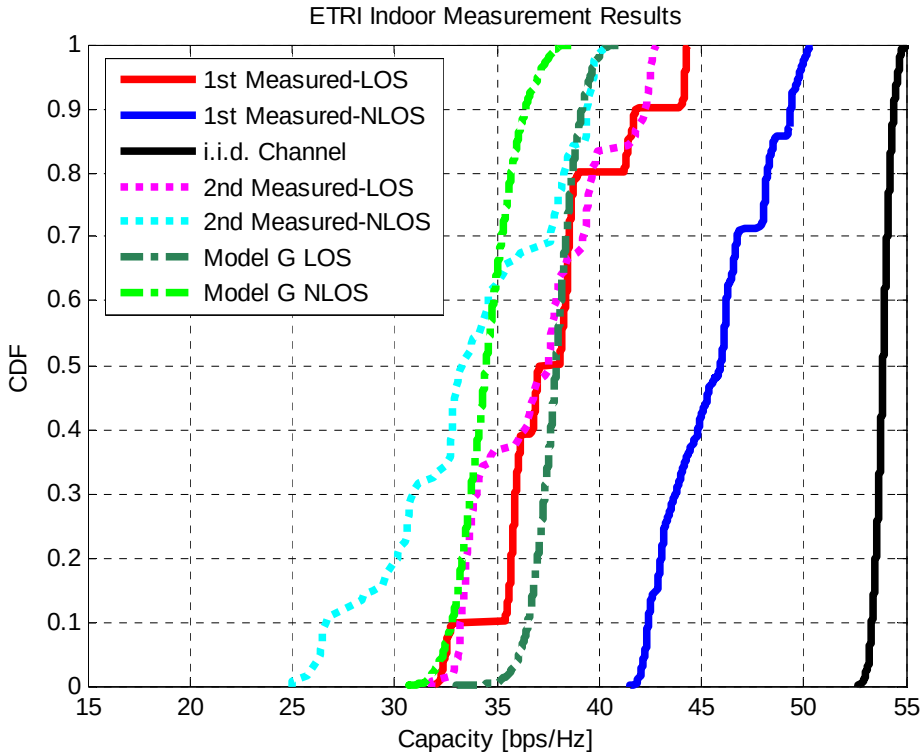
Measurement Result: Capacity

- 1st measurement: NLOS > LOS
- 2nd measurement: NLOS < LOS (← More on this later)
- LOS: 1st and 2nd measurements agree with each other



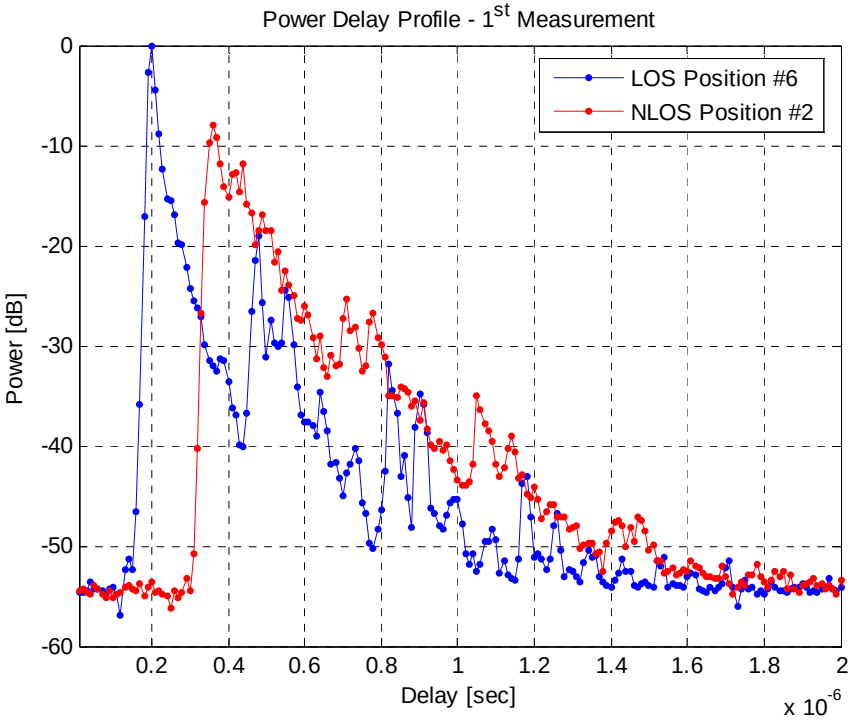
Measurement Result: Model G

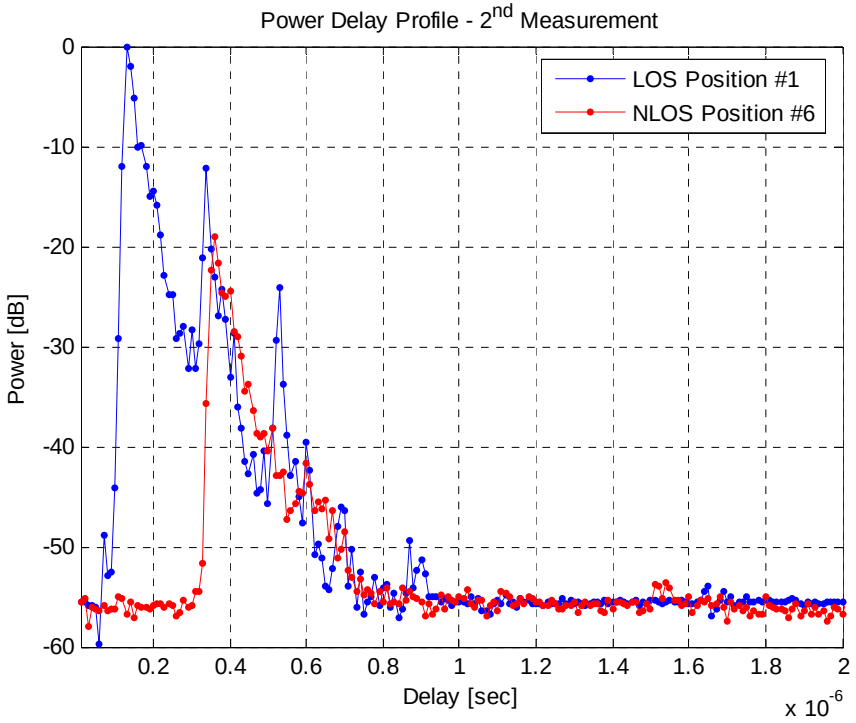
- Model G (based on Model D)
  - Delay Spread: same as Model D (50 nsec)
  - Angular Spread: ¼ of Model D
  - AoA: +30º, -30º, -180º, AoD: +30º, -30º, 0º



Measurement Results: Power Delay Profile

- 1st measurement
  - LOS & NLOS: 4 clusters
  - NLOS: more rays within cluster
  - NLOS > LOS
- 2nd measurement
  - LOS: 4 clusters
  - NLOS: 2+ clusters
  - LOS & NLOS: about the same rays within cluster (see 1st cluster)
  - LOS > NLOS





Concluding Remarks

- Our measurement results show that TGn channel models do not model Corridor environment very well
- Site dependency of Capacity
  - LOS capacity is not affected by measurement sites
  - NLOS capacity varies significantly depending on the measurement
    - 1st measurement site: metal walls, closed ended
    - 2nd measurement site: concrete walls, open ended
- Model G: Corridor Model
  - In terms of # clusters (3~4), model G is closer to model D than B
  - Model G, when obtained from model D by reducing the AS by a factor 1/4, seems to agree with the measurement data
  - This is a tentative model, and further work is required
- Need more measurement and analysis
  - to verify the above approach, or
  - to develop a new Model G with appropriate parameters (DS, AS, AoA, AoD, etc)