

On the Coverage Impact for RS Deployment

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Purpose:

[The coverage improvement impact for the planed optimize RS deployment vs, Random deployment](#)

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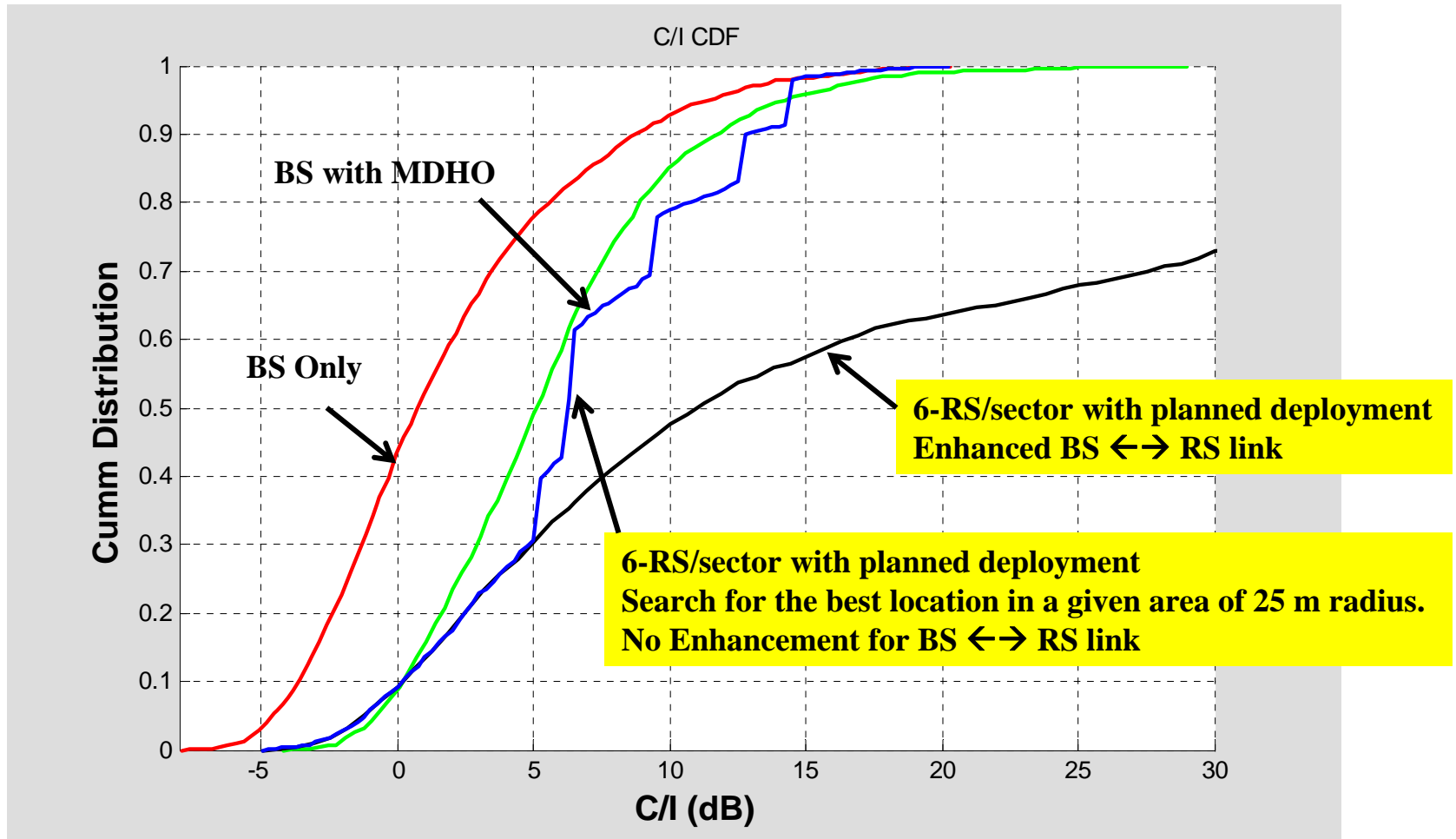
Introduction and Background

- For the usage scenario of in-cell coverage hole, the random dropped RS node deployed by the user is compared with the planned deployment by the operator
- We show the planned deployment can achieve the significant coverage improvement by selecting good RS locations but at deployment cost
 - e.g. higher RS site acquisition cost
- We also show that by improving relay to base link the further improvement in coverage and capacity can be obtained.

Simulation Assumptions

- Below roof top RS
- Case-1 Optimized BS \leftrightarrow RS link
 - e.g. directional antenna at both node
- Case-2 Conventional BS \leftrightarrow RS link
 - e.g. sectorized BS antenna and omni RS antenna
- Path loss and shadowing is modeled
- Scenarios Compared:
 1. Planned Deployment of RS for Case-1 (6 RS/sector)
 2. Planned Deployment of RS for Case-2 (6 RS/sector)
 3. Random Deployment of RS for Case-2
 - 6 RS/sector
 - 15 RS/sector
- Simplified Simulation Methodology
 - For give realization of path loss and correlated shadowing
 - The RS location is optimized or
 - Random dropped

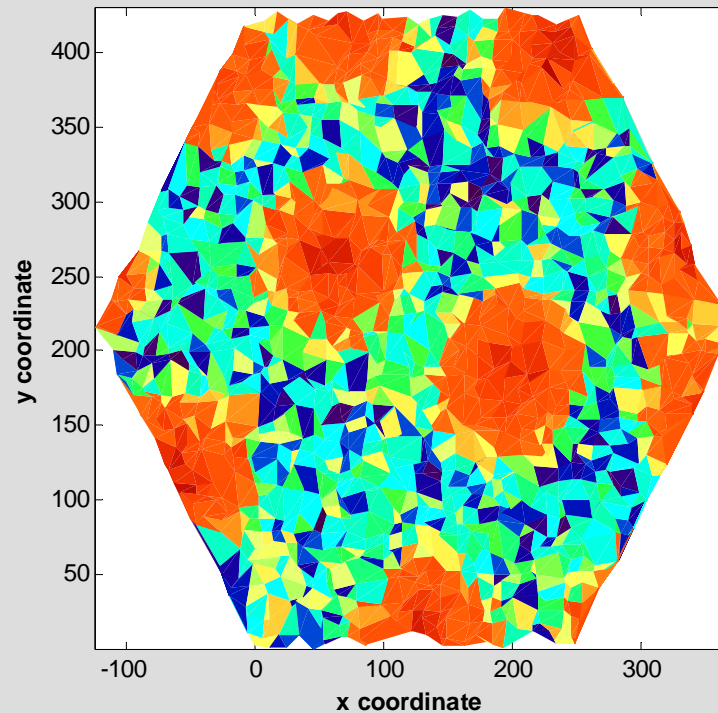
Coverage Performance Comparison for the Planned RS Deployment (*SINR CDF*)



Coverage Performance Comparison for the Planned RS Deployment (*SINR distribution plot*)

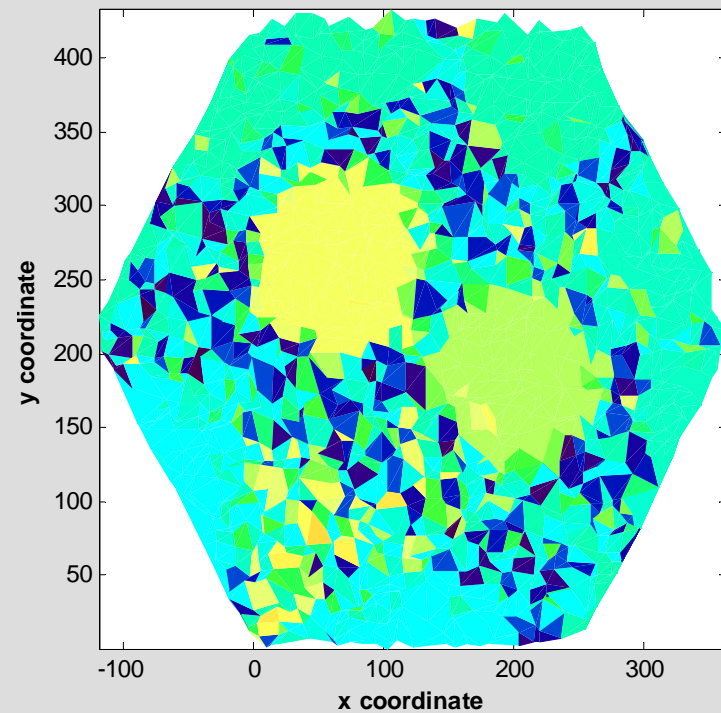
Case-1: Enhanced BS \leftrightarrow RS Link and RS location optimization

Case-2: Enhanced BS \leftrightarrow RS Link and RS location optimization



Best coverage and throughput gain

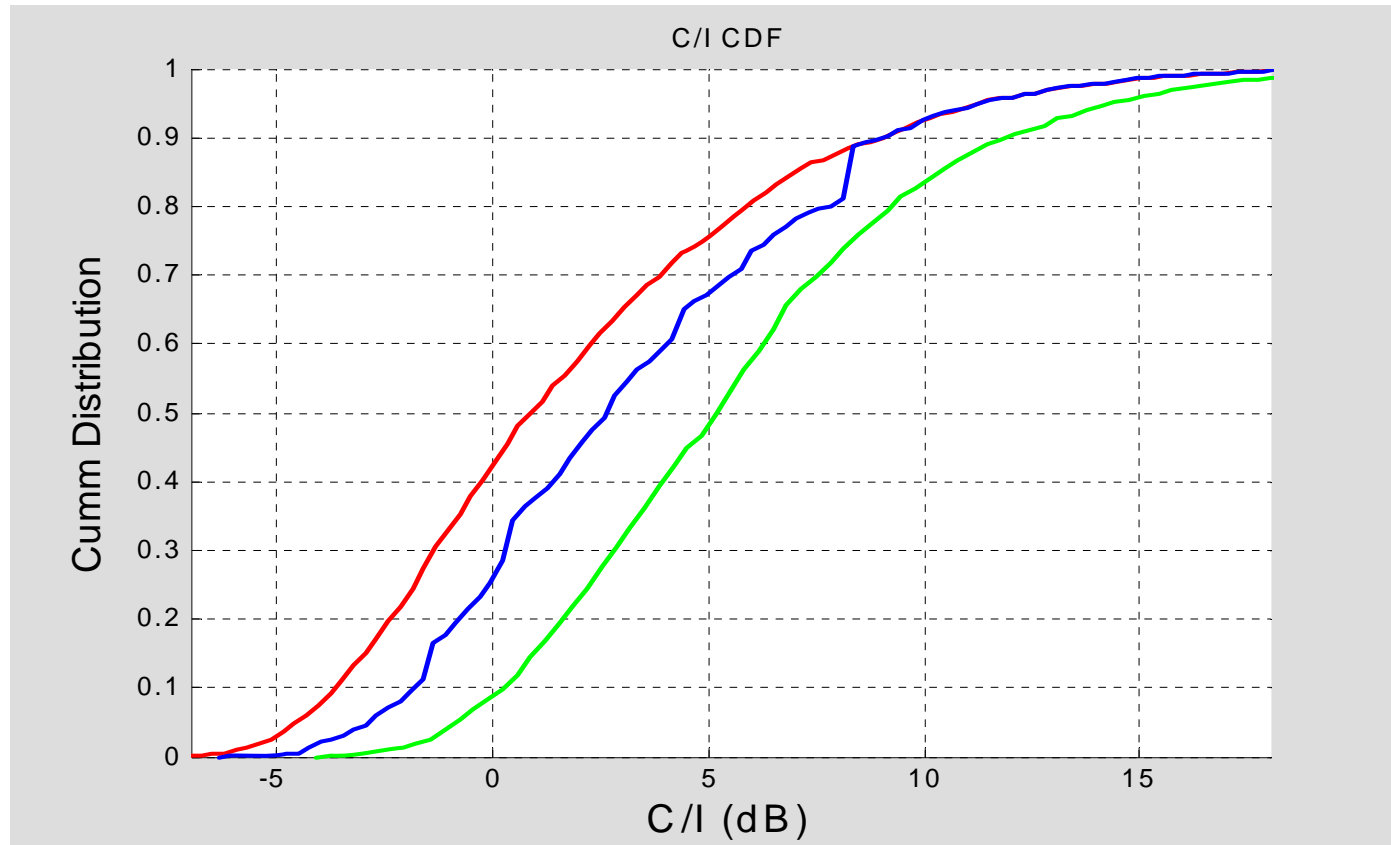
EQT capacity improvement = 250%
95% coverage improvement = 4.2 dB
Median C/I improvement = 10 dB



the coverage and throughput gain are reduced

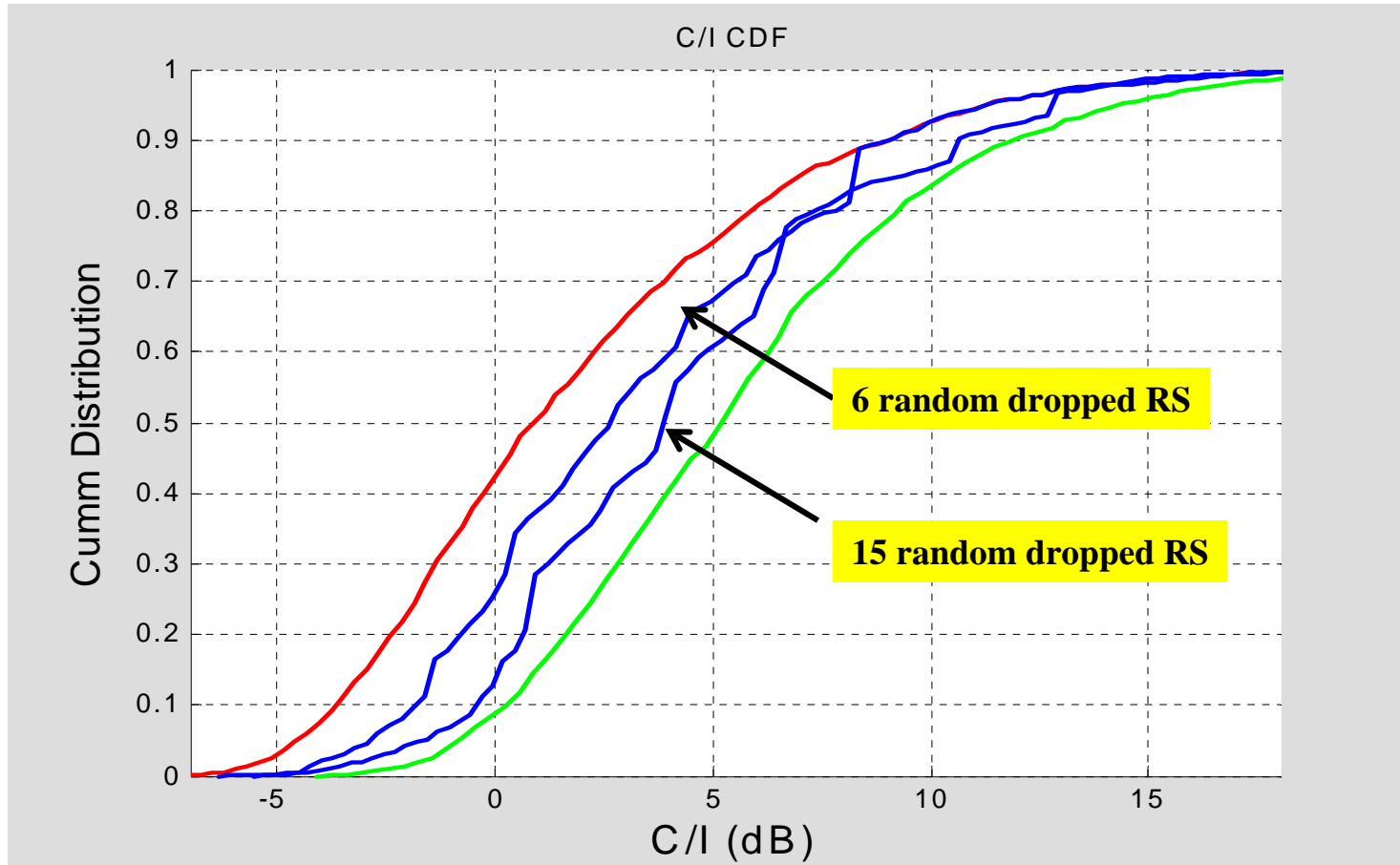
EQT capacity improvement = 160%
95% coverage improvement = 4.2 dB
Median C/I improvement = 7 dB

Coverage Performance Comparison for the Random RS Deployment (6-RS/Sector)



EQT capacity improvement = 31%
95% coverage improvement = 1.6 dB
Median C/I improvement = 1.8 dB

Coverage Performance Comparison for the Random RS Deployment (*15-RS/Sector*)

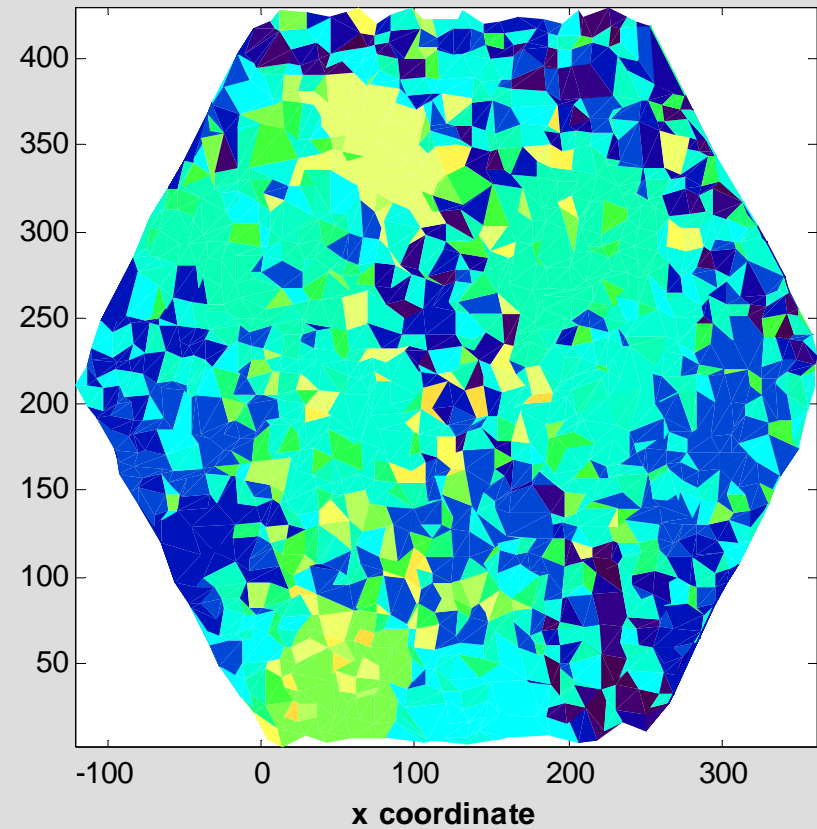
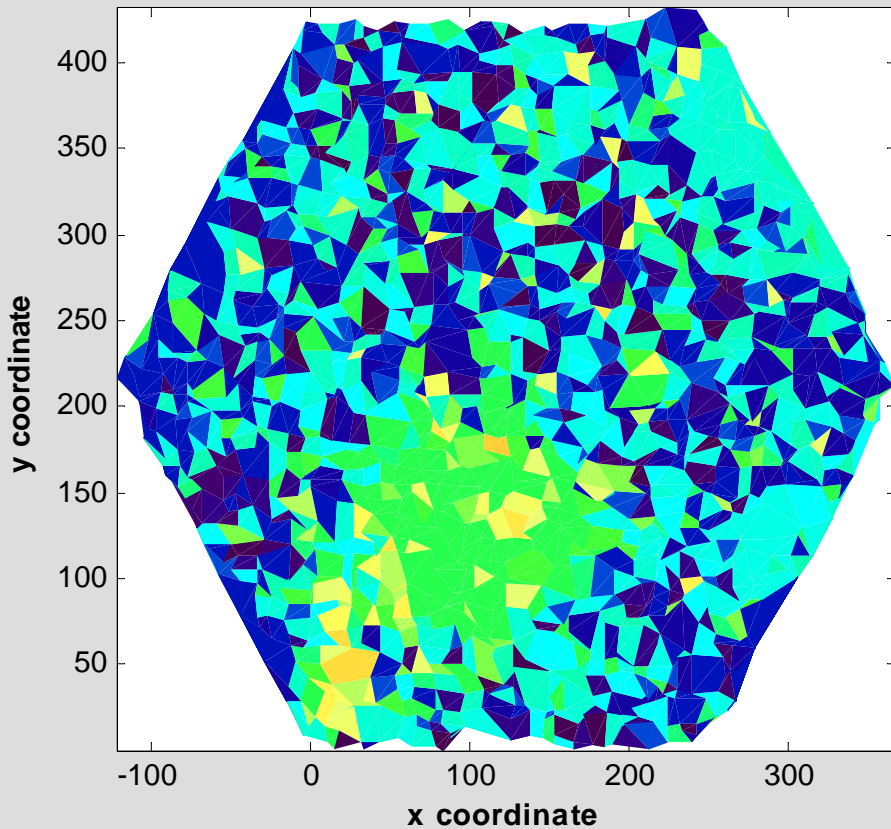


EQT capacity improvement = 70%
95% coverage improvement = 3dB
Median C/I improvement = 3.4 dB

Coverage Performance Comparison for the Random RS Deployment (*SINR distribution plot*)

6 random dropped RS

15 random dropped RS



Summary

- A preliminary simulation study on the deployment strategies for the RS and their impact on the coverage improvement is compared