



IMT-A Evaluation by TCOE India:

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Motivation for IMT-A Evaluation

- Adopt forthcoming technologies to **Indian context and environment**
- Helps in its role of **policy advocacy** to the Govt of India
- Builds a **critical mass** of researchers & students

- India is looking to IMT-A technologies to **provide cost-effective Nationwide broadband connectivity**
 - Wire line penetration is modest (40 Million)
 - Wireless cellular (610 Million)
 - A record 20.31 milion phones were added in March 2010!



TCOE India Evaluation

- **Evaluation Team**

- **TCOE**

- Faculty members & scientists from premier institutes all over India.
 - Research scholars and students

- **Centre of Excellence in Wireless Technology (CEWiT)**

- CEWiT actively participates in IEEE and 3GPP forums
 - Interacts with other EGs / proponents
 - Provides simulation support along with IITs.



Evaluation Results for Downlink, in Urban micro environment

- **Sector Spectral Efficiency:**

	OL-Rank1 precoding	OL-SFBC
Without Control overhead	2.55 bps/Hz	1.76 bps/Hz
With Control Overhead	2.21 bps/Hz	1.53 bps/Hz

- **Cell Edge Spectral Efficiency**

	OL-Rank1 precoding	OL-SFBC
Without Control overhead	0.1 bps/Hz	0.05 bps/Hz
With Control Overhead	0.087 bps/Hz	0.044 bps/Hz

* control overhead is 13%, and pilot overhead is included.



Current Status

- TCOE evaluation is well on way to meet targets
- We expect to meet downlink spec-eff targets with 2 antennas at BS and MS.
- Current results are reported only for Rank 1 Precoding and SFBC (inside OL Region) .
- MU-MIMO provides a substntial additional benefit.



About the Final Report

- TCOE India will report a single consolidated final report.
- This report will include evaluation results for Indian rural open area model. (Since this is not an ITU specified test case, these results will be informative and will appear in Appendix.)
- A combination of OL region, rank-1 precoding, MU MIMO and CDR is expected to exceed ITU requirements with 2-Tx antennas in Downlink. These results will be included in the final evaluation report.



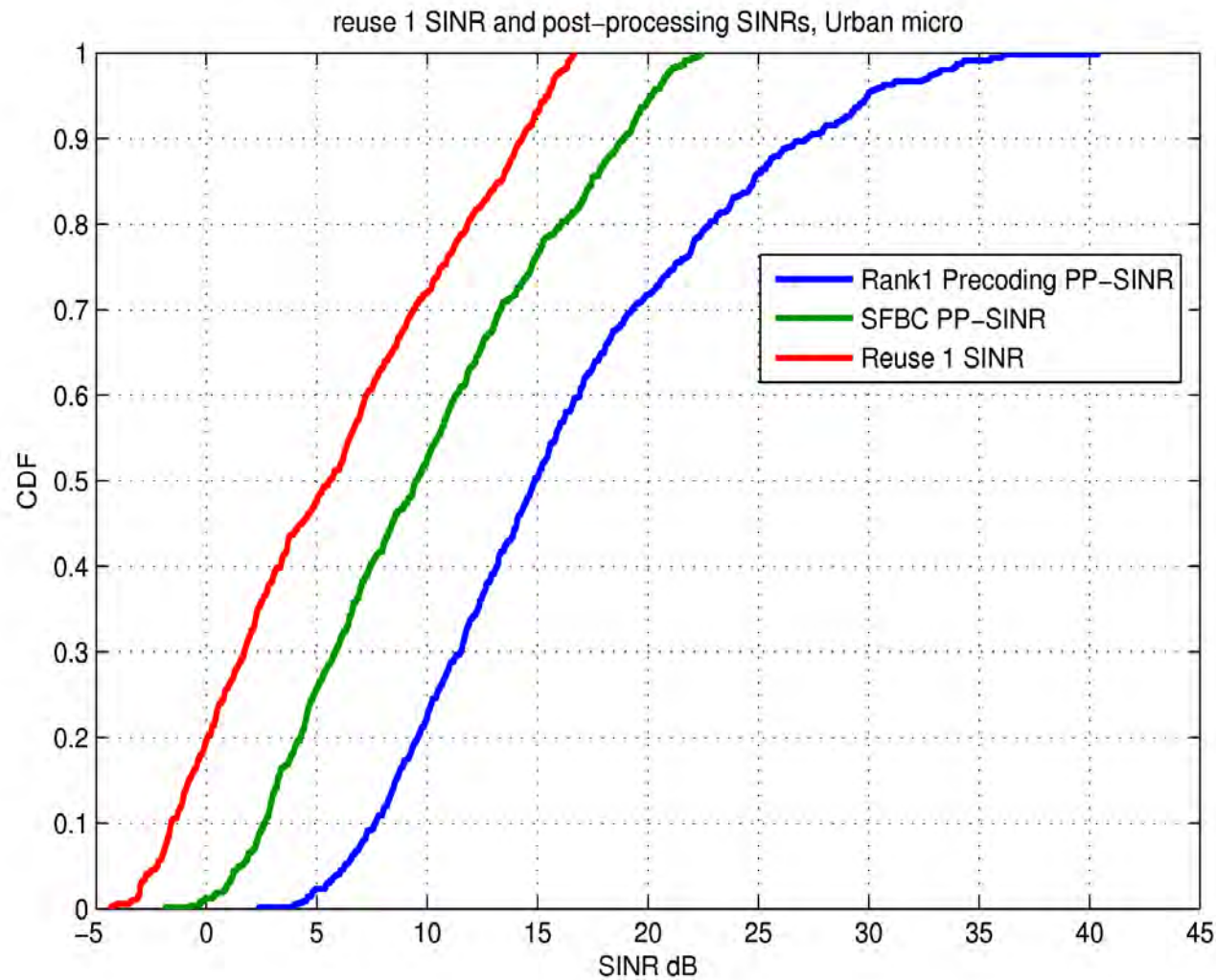
Appendix 1

Simulation assumptions

- OL Region Enabled
- CQI based on PP-SINR
- PF scheduler with a $T_c = 250$ ms
- CC HARQ is used. 90% packet success rate is maintained in the 1st transmission.
- 2Tx-2Rx Rank 1 precoding
 - MMSE Receiver.
 - Localised allocation (SLRUs).
 - CoFIP with 16.6% pilot density.
- 2Tx-2Rx SFBC
 - MRC Receiver.
 - Blk Distributed allocation (NLRUs).
 - Interlaced Pilots with 11% pilot density.

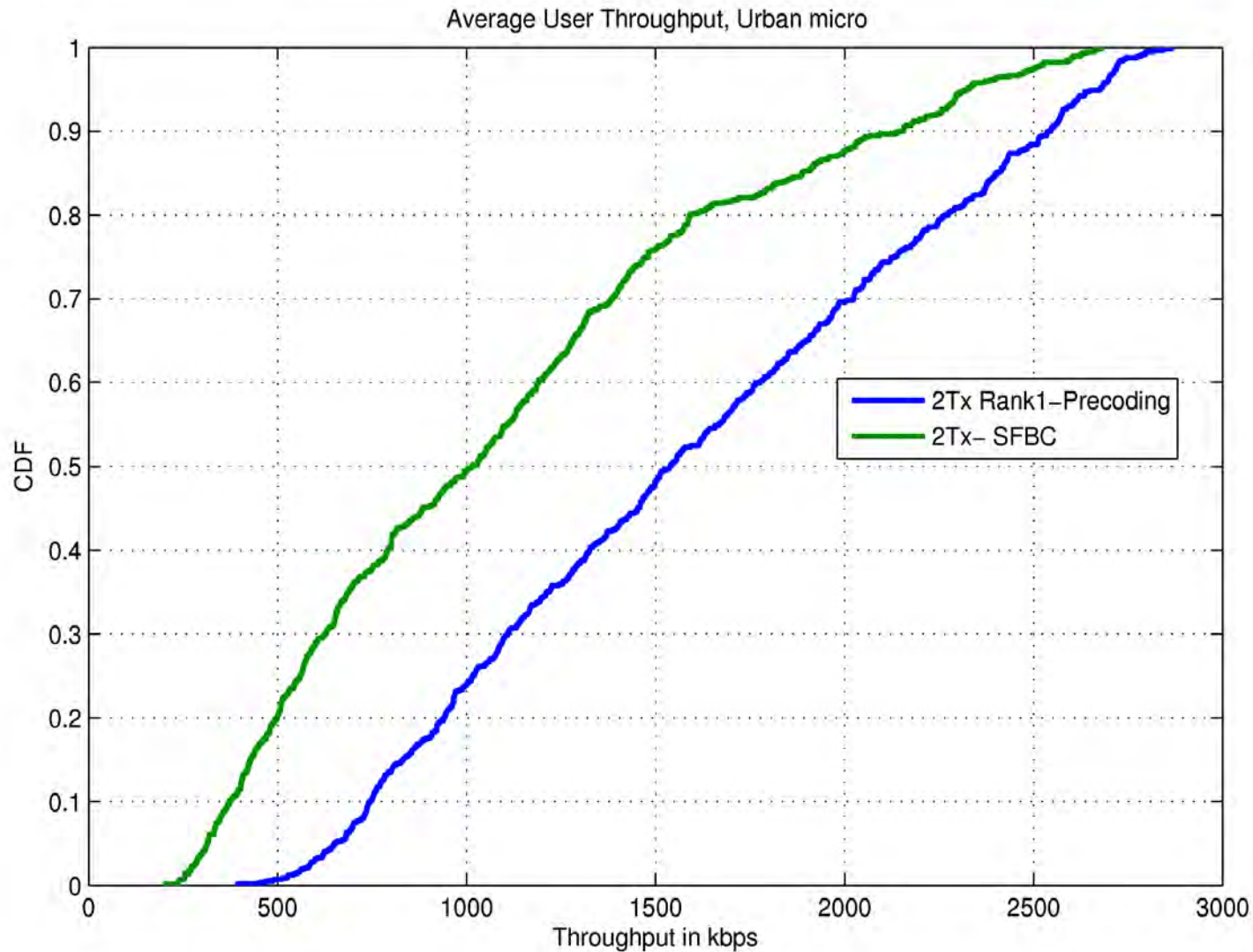
Appendix 2

Post processing SINR, Urban micro



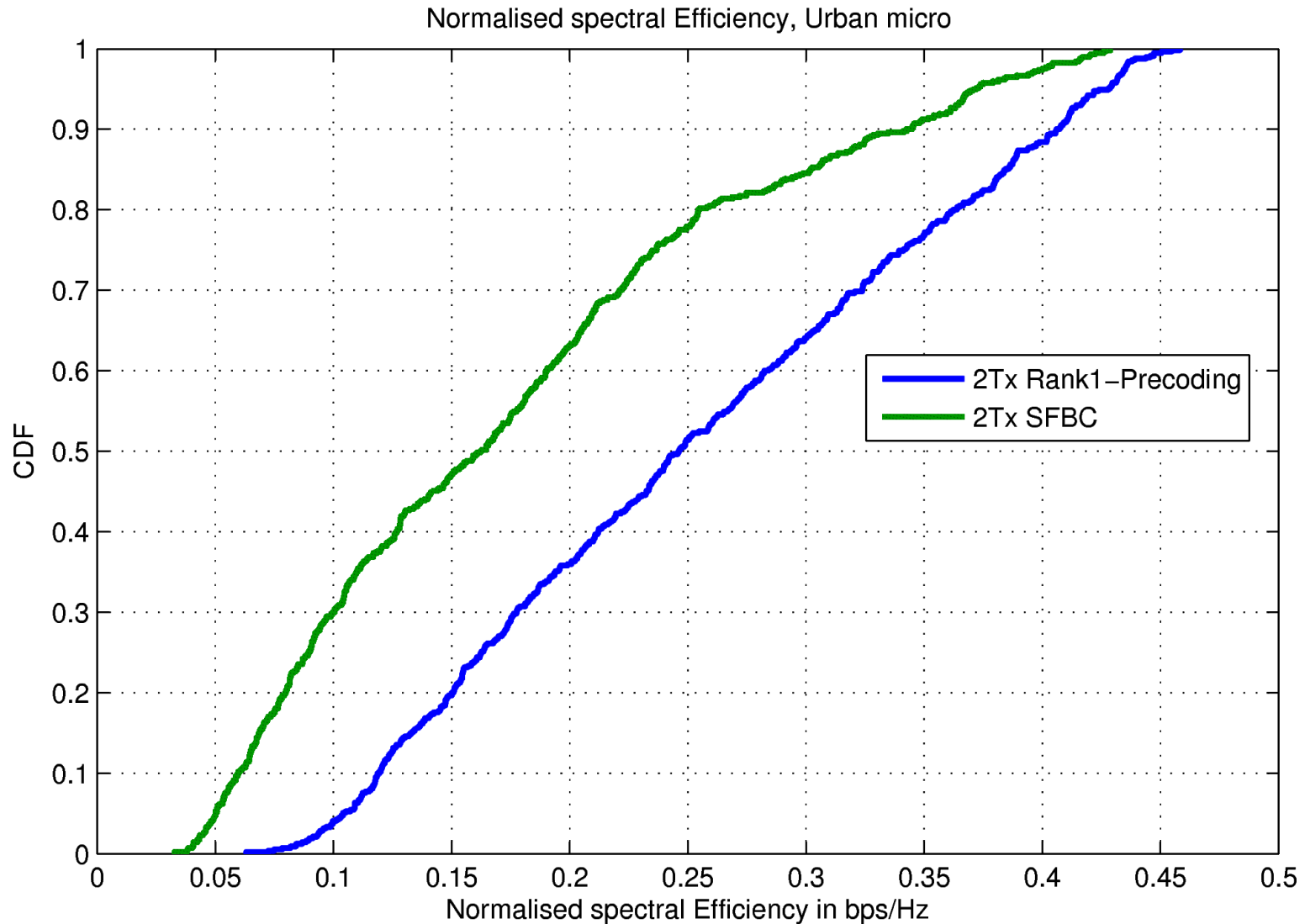
Appendix 3

Average User Throughput, Urban micro



* Pilot overhead is included

Appendix 4: Normalized Spectral Efficiency, Urban micro



*Pilot overhead is included.

Appendix 5

Indian rural open area model

