

Motivation for new work item proposal: Downlink TPC Enhancements for UMTS

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Background

- **SI on Downlink enhancements for UMTS is proposed to be completed at RAN#68 (TR 25.706)**
- **One objective of the SI was**
 - Investigate mechanisms to enhance DL control channel performance, for example: (RAN1)
 - Repeat DL TPC commands in a number of consecutive slots to allow soft combining at the UE in order to reduce DL TPC transmit power
- **Conclusions of the SI**
 - Two algorithms have been identified
 - Reduced TPC frequency with repetition of TPC commands
 - Reduced TPC frequency with DTX of TPC commands
 - Gains in the downlink have been identified according to downlink evaluations
 - $\sim 10\log_{10}N$ dB gain (N is the repetition/decimation factor) observed from link-level evaluation
 - $\sim 8\%$ of the total base station transmission power can be saved from system-level evaluation
 - Limited impact to the uplink according to uplink evaluations
 - Uplink performance with the new algorithms is comparable with the legacy algorithms (0.1 to 0.6dB uplink performance impact)

Proposed WI Objectives

- The work shall consider DL enhancements for UMTS and focus on the RAN1 aspects already studied as part of the "Study on DL enhancements for UMTS"
- The objective of this work item is the specification of mechanisms for downlink control channel performance improvements. Identified solutions: repetition of TPC commands and DTX of TPC commands (RAN1)
 - UE capability (RAN2)
 - Potential signaling between NodeB and RNC (RAN3)