

Motivation for new Study Item proposal Study on Network-Assisted Interference Cancellation and Suppression for UMTS

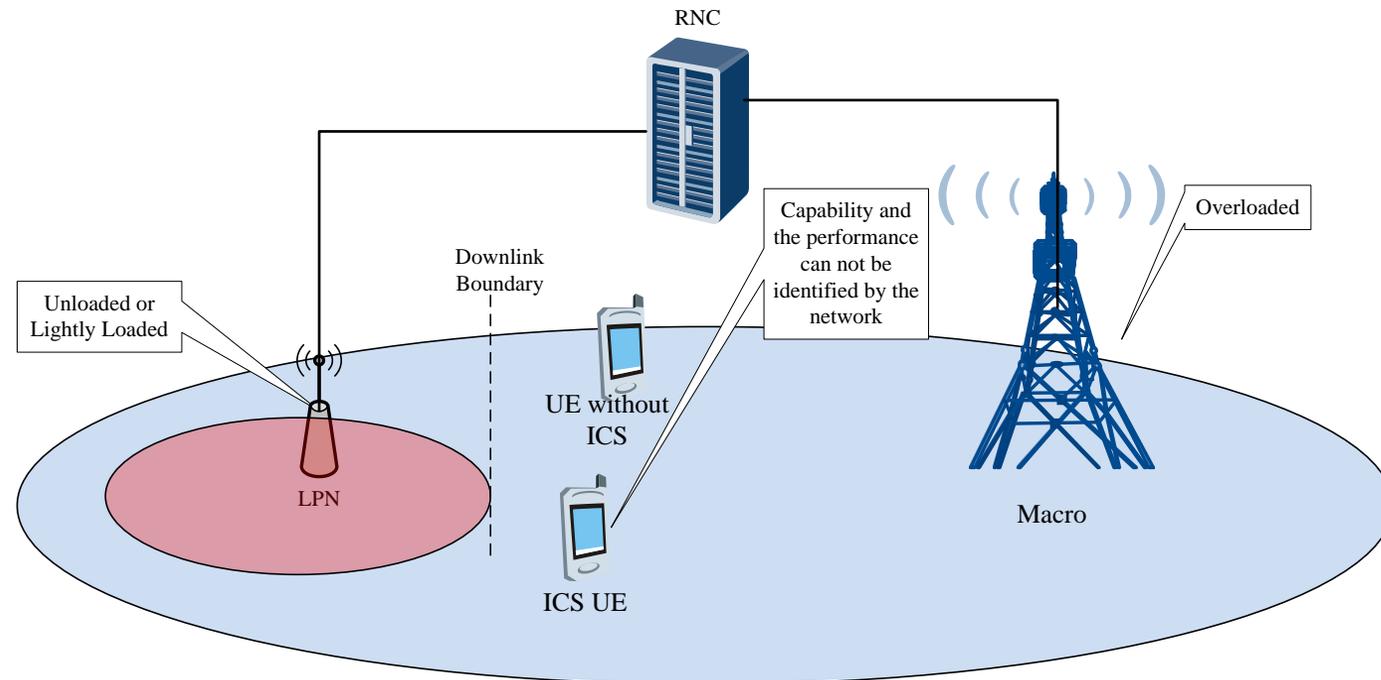
Huawei, HiSilicon

Background

- To improve the capacity, Cell densification techniques, such as cell splitting and Hetnet, are commonly used in the network.
 - More cell edges are created;
 - More imbalanced cells would be created → especially for Heterogeneous network deployment;
- Range expansion is key technique to balance the load between cells → more offloading to the lightly loaded cells
 - ✓ Improved offloading rate to be worthy of the LPN Cost;
 - ✓ More attractive for operators because of the insensitivity of the deployment limitations——No need to always deploy LPN at the hotspot center
 - ✓ Reduced UL/DL imbalance between LPN and Macro
 - ✓ Improved uplink performance
- Range expansion introduces more cell edge UEs with very low geometry → NAICS is used to improve the cell edge performance

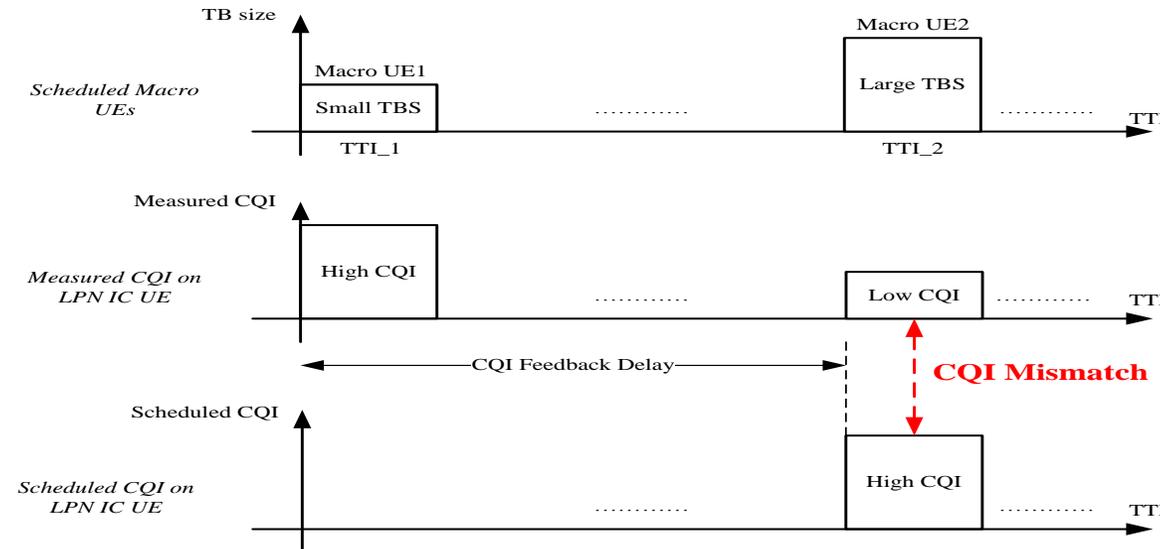
Motivation of network assisting ICS

- Considering the range extension, for today's ICS UE without network assisting :
 - The link level performance of the cell edge ICS UE is affected by the UE's capability and the air condition;
 - It is not clear how the network to identify the ICS UE in the network → ICS capable UE would be too late to offload;
- ICS capability or ICS UE's performance should be reported to facilitate the network load balancing;



Motivation of network assisting ICS

- For ICS UEs without network assisting:
 - CQI mismatch—The CSI reporting is unstable due to the interference variation, which degrades the performance a lot;

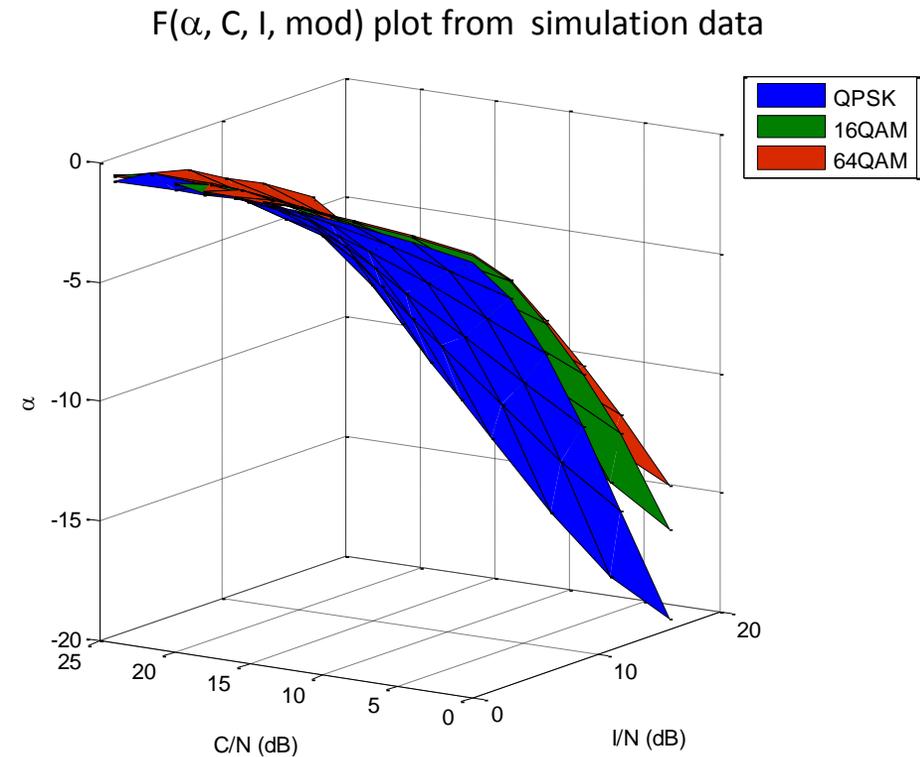


- the complexity to perform ICS is high;

→ Network assisting should be considered to resolve the CQI mismatch issue and reduce the ICS UE complexity;

Motivation of network assisting ICS

- Deriving the adjusted CQI for SLIC UE
- SINR before SLIC (γ) and after SLIC (γ')
$$\gamma = \frac{C}{I+N} \quad \gamma' = \frac{C}{\alpha I+N}$$
- IC efficiency (α) and interference environment (C, I)
 - Interferer SNR, I/N (slow variation)
 - Serving SNR, C/N (slow variation)
 - Interferer modulation order (fast variation)
- If α vs C/N, I/N is known, network can derive SINR after SLIC



Thank you !

