Interference Alignment in Cellular Networks
Interference Alignment for Energy Efficiency Improvement

CHALLENGE AND BREAKTHROUGHS

• The energy efficiency - spectral efficiency (EE-SE) tradeoff in 4G networks with full reuse is interference limited.

• Edge-cell mobiles suffer the most from interference.

• Objective of interference alignment is to increase the capacity per cell through interference reduction with a limited resource restriction per cell.

Minimize Interference and Maximize Resource Utilization per Base Station for Improved System Efficiency
Interference Alignment

KEY ACCOMPLISHMENT AND RESULTS

• Designed a 2x2 MIMO / dual frequencies scheme with limited feedback

• Developed a joint scheduler-resource selection algorithm

Increases the Cell Capacity by a Factor 2 and Reduces Energy Consumption at the Network Level by 15%
Interference Alignment

DEMO DESCRIPTION

• Highlights the most important technical point: channel estimation and diversity gain
• IA technique is evaluated in new shielded facility in CorteXlab in Lyon, France
• Two BSs and 3 mobile nodes are emulated remotely
• Algorithms and channel conditions are tunable

FIT-CorteXlab is a Remotely Accessible Facility Allowing to Test Multi-User Communication Algorithms and Technologies