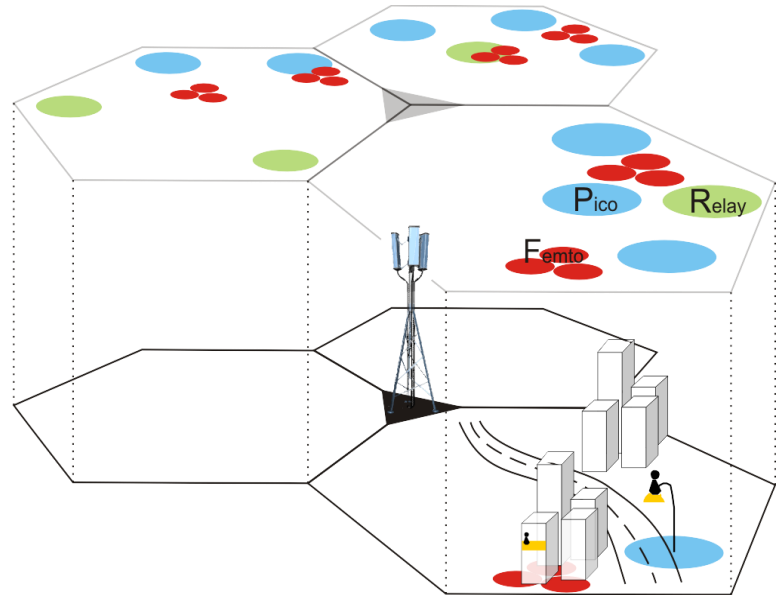


Multi-Layer Cellular System Evaluation

Wireless Communication and Networks

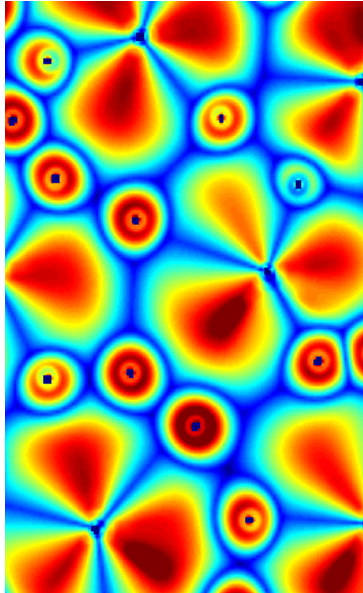
- Multi-cell system level evaluation, benchmarked against 3GPP
- Link-2-System interface embedded
- Detailed link-level (including impairments)
- Optional embedding of measured channels
- Scalable evaluation architecture (multi-core support)



Multi-Layer Cellular System Evaluation

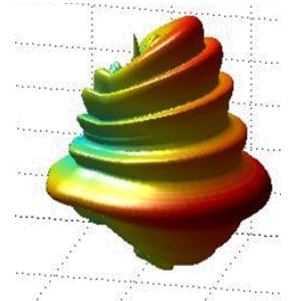
Multi-Cell Channel Model

- 3GPP's Spatial Channel Model
- Winner Phase 2 model
- ITU channels model
- Real measured channels
- Multi-layer support for
Urban-macro
Pico-cell
Indoor femto



Physical Layer

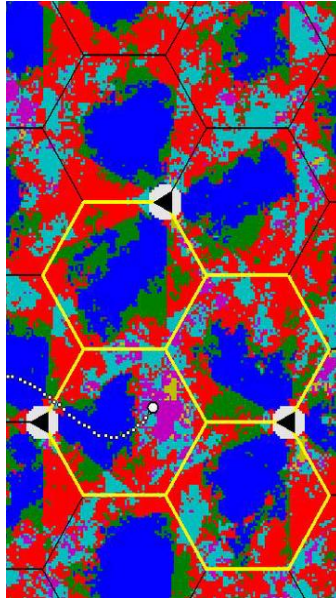
- Linear receive beamforming
 - Maximum ratio combining
 - Optimum combining
- Transmit beamforming
 - Zeroforcing
 - CoMP joint transmission
 - Clustered dirty-paper precoding
- Pilot-based channel estimation
- Channel feedback
 - Channel quality indicator (CQI)
 - Precoding matrix indicator (PMI)
 - Channel state information (CSI)



Multi-Layer Cellular System Evaluation

Medium Access Control Layer

- Hierarchical radio resource management
 - Round robin
 - Proportional fair
 - Max-Min fairness
 - Score-based metric
- Link and rank adaptation
- User grouping
- Cluster selection
- Interference and cluster coordination



Network Layer

- Key performance indicator extraction
 - Capacity
 - Coverage
 - Energy efficiency
 - QoS/QoE
 - Security
- Self-organizing features
 - Long-term power control
 - Antenna down-tilting

