Resource Allocation for Inter-Cell Interference Coordination

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Purpose:

To adopt the inter-cell interference coordination (ICIC) scheme proposed herein into IEEE 802.16m system description document (SDD).

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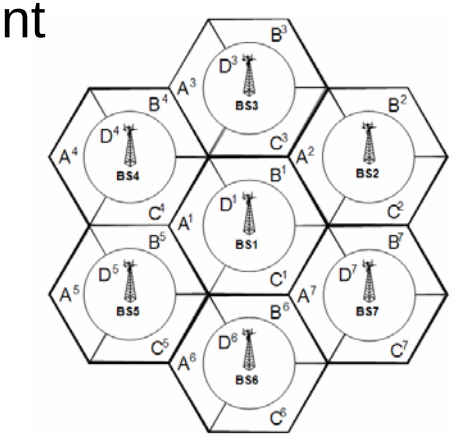
Inter-Cell Interference Coordination

- In a multi-cell deployment, interference management is often the most challenging problem near the cell edge.

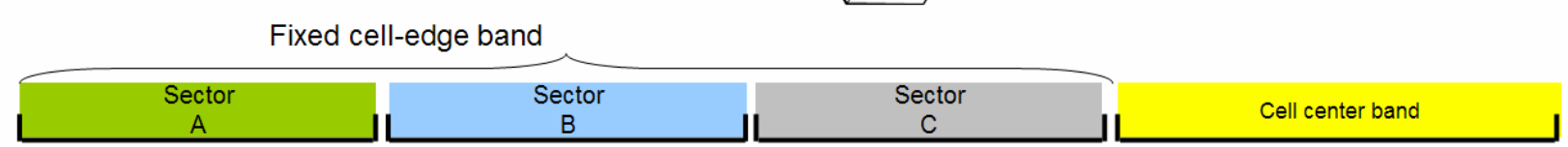
- Resource allocation among cells can be
  - Static
    - simpler
    - but not flexible enough
  - Dynamic
    - better performance
    - but require more signaling

Proposed Resource Allocation

- Example network deployment



- Fixed cell-edge band

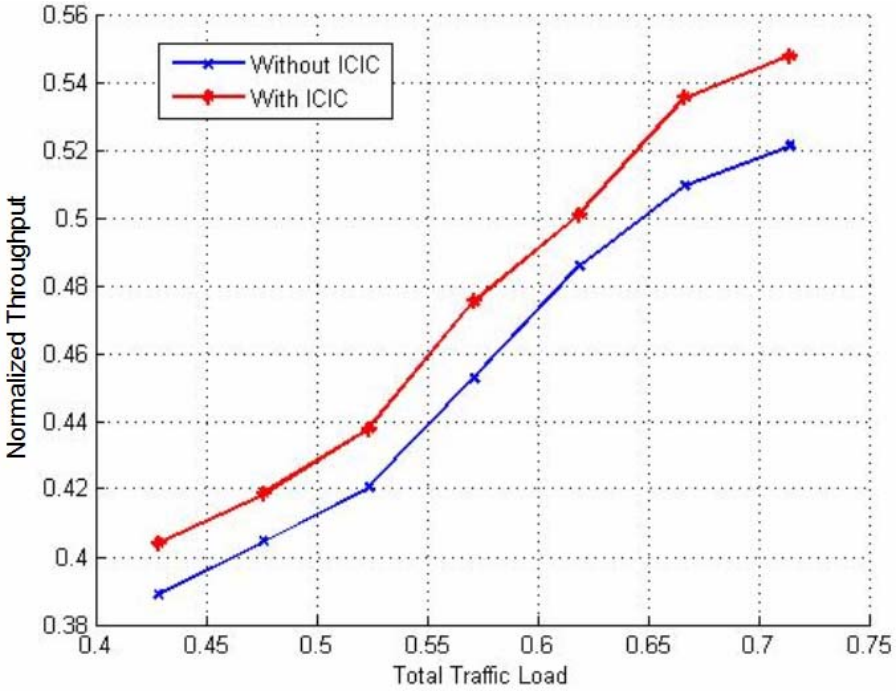


- Adaptive cell-edge band
  - Reserved
    - notion of ownership
    - primary vs. secondary users
  - Free

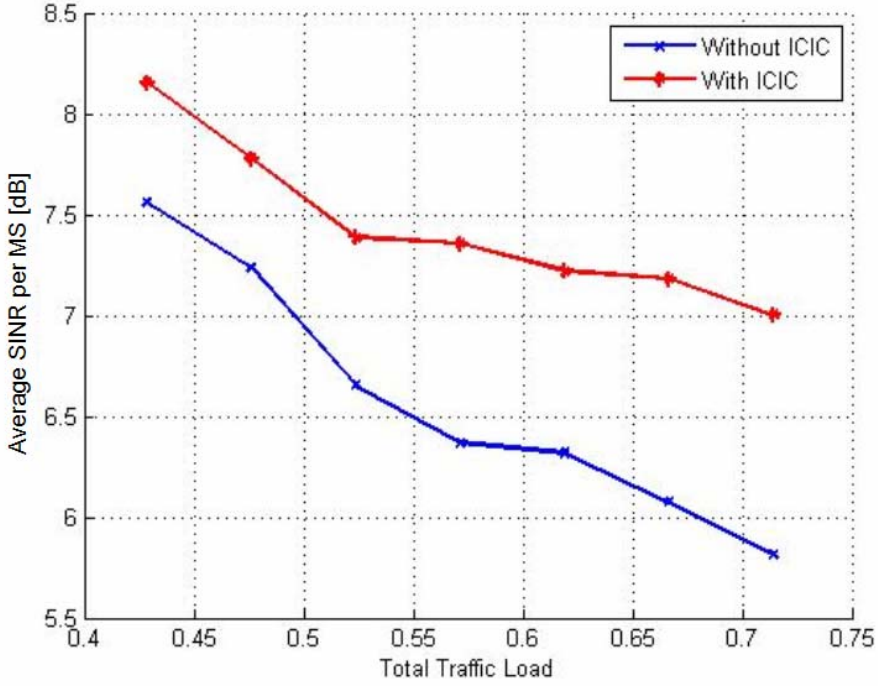
Performance Gains

- The proposed resource allocation scheme for ICICI can significantly improve the SINR performance.

Normalized average cell-edge Throughput versus traffic load



Average SINR per cell-edge MS in dB versus system's traffic load.



Conclusions

- Inter-cell interference (ICI) is a very important issue to address in OFDMA network.
- Proper resource allocation for inter-cell interference coordination (ICIC) can achieve significant performance improvement.
- Propose to add a new subclause in SDD text for interference coordination/management
  - *Fixed cell-edge band allocation, adaptive cell-edge band allocation, and a hybrid of both can be used in an IEEE 802.16m network to mitigate interference. To enable adaptive cell-edge band allocation or hybrid band allocation, neighboring BSs need to exchange such information as the interference level of certain resource blocks, the resource allocation it has made for these MSs that are highly susceptible to interference, the desire to reclaiming the reserved resource that has been borrowed by the neighboring cell, etc.*