

Resource allocation for Hot zone operation (Control and Traffic channel configuration for femtocell BSs and Hotzone BS)

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Venue:

TGm SDD: Femtocells

Base Contribution:

Purpose:

Discuss and adopt the proposed text for SDD

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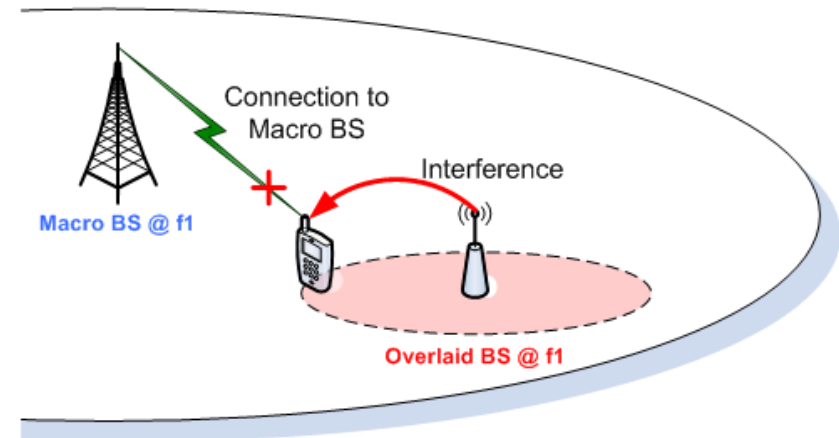
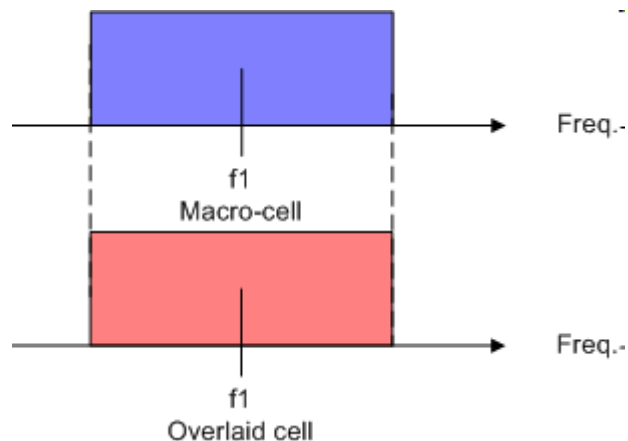
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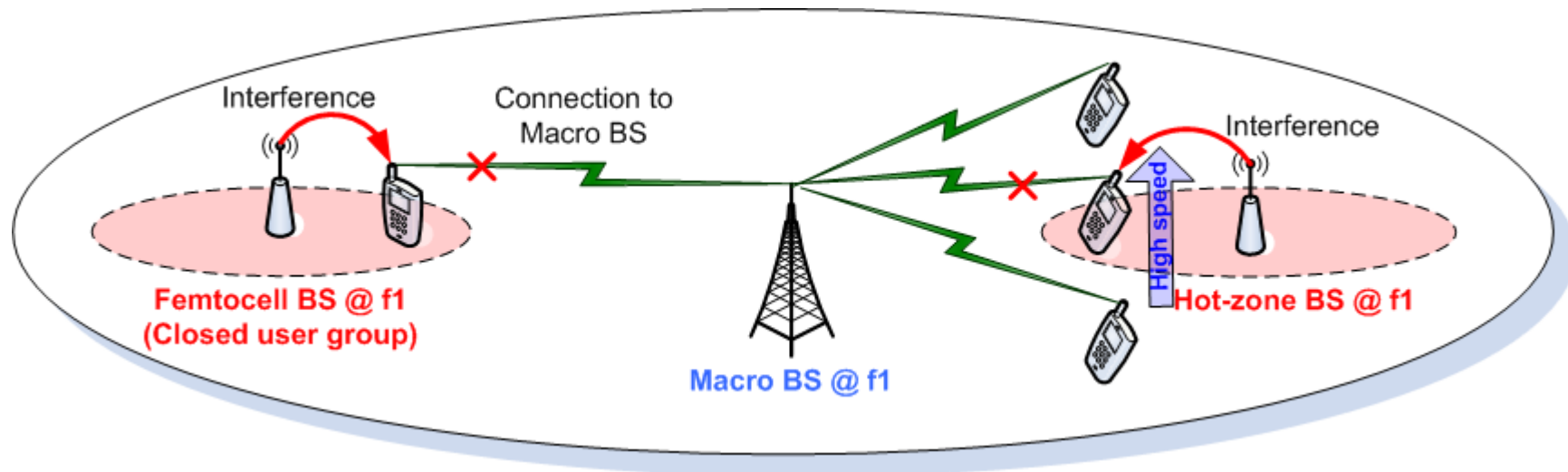
Motivations (1/2)

- Overlaid cell **blocks signal reception from Macro BS**
 - Overlaid cells is interference source to Macro BS coverage
 - The same spectrum may be used for the cells
- Overlaid cells are inevitable
 - **Femtocell BSs** in other cell coverage
 - **Hotzone BSs** in macro coverage
 - Installed outside to support heavy traffic in spots within macro coverage
 - Allowing public access to increases system capacity
 - A **open access femtocell BS installed outside** is a good example



Motivation 1/2

- Service **discontinuity to MSs in overlaid cell** coverage
 - A MS in non-allowed CUG¹⁾ femto cell BS
 - The MS can't make handover to the femtocell BS
 - A high speed MS in Hot zone coverage
 - Dwelling time at Hot zone may not be long enough to make HO
- **Need to keep connection** between macro BS and the MSs



1) CUG: Closed User Group

Proposed scheme

- Overlaid BSs reserve resources for MSs connected to Macro BS
 - Overlaid BS does not transmit signal in the reserved resource
 - Macro BS allocate the reserved resource to the MSs
- Fast detection of such BSs would be greatly helpful to manage interference

- Closed User Group (CUG) Femtocell BS
 - MS detects non-allowed CUG femtocell BS
 - MS requests the serving BS to allocate the reserved resource if needed

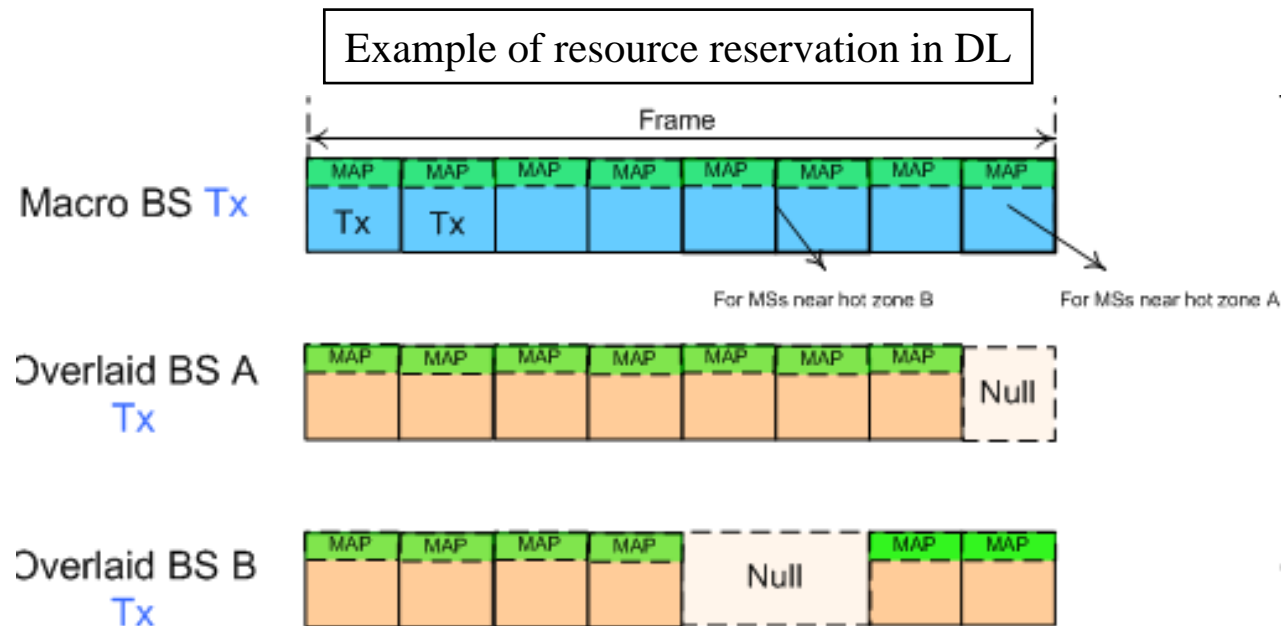
- Hot zone BS
 - Two solutions
 - HO to hotzone BS
 - Use reserved resource to be connected to macro BS
 - Two schemes are used in hybrid manner depending conditions
 - MS detects Hot zone
 - MS decides whether it makes HO to Hot zone or keeps connection to BS
 - HO to hot zone: Normal HO procedure
 - Keeping connection to BS
 - Hot zone reserves resources
 - MS signals BS to allocate the reserved resources
 - BS allocates the reserved resources to the MS

Fast detection of cells

- Fast detection of Hot zone and CUG femto BS
 - Before interfering severely each other
 - Critical when MS's velocity is high
- Physical layer identifier is needed
 - MS's short dwelling time at such BSs coverage
 - Possibly around 1 second when MS's speed is high
 - Short enough for HO long enough for service interruption
 - S-SCH provides S different groups of S-SCH sequences to identify different groups of cells in PHY level.
 - One group belongs to a hotzone BSs

Example of reserved resources

- Overlaid BS reserves **subframes in DL**
 - It provides reliable reception of MAP and traffic from Macro BS
- Overlaid BS reserves resource in **FDM manner in UL**
 - It provides coverage in edge users



Proposed text

[Insert the following text]

17.x PHY level cell identifier

S-SCH provides N different S-SCH sequences to identify different cells in PHY level. Different S-SCH sequences are grouped to groups. A S-SCH sequence in a group is assigned to a specific cell type: Macro cells, Hotzone cells, or Femto cells. It enables MSs to identify cells in PHY level and makes efficient network access. A S-SCH group can be further sub-grouped to identify whether the BS is closed user group or non-closed user group Femtocell BS.

17.y Support of overlaid BS

A overlaid BS can reserve resource in cooperation with macro BS where the overlaid BS is overlaid. The reserved resource can be used to keep the connection between a MS in the overlaid BS cell coverage and the macro BS. MS can report macro BS to allocate the reserved resource of the overlaid BS.