

# Base Station Coordination





## Overview

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One efficient technique to combat intercell interference is via exploiting coordination among multiple base stations, which is known as multicell processing or simply base station coordination. What is a base station?

What is Base Station?

A base station represents an access point for a wireless device to communicate within its coverage area. It usually connects the device to other networks or devices through a dedicated high bandwidth wire of fiber optic connection. Base stations typically have a transceiver, capable of sending and receiving wireless signals;.

What are the components of a base station?

**Power Supply:** The power source provides the electrical energy to base station elements. It often features auxiliary power supply mechanisms that guarantee operation in case of lost or interrupted electricity, during blackouts. **Baseband Processor:** The baseband processor is responsible for the processing of the digital signals.

What are the properties of a base station?

Here are some essential properties: **Capacity:** Capacity of a base station is its capability to handle a given number of simultaneous connections or users. **Coverage Area:** The coverage area is a base station is that geographical area within which mobile devices can maintain a stable connection with the base station.

Why are base stations important in cellular communication?

Base stations are important in the cellular communication as it facilitate seamless communication between mobile devices and the network communication. The demand for efficient data transmission are increased as we are advancing towards new technologies such as 5G and other data intensive applications.



Is base station scheduling NP-hard?

To this aim, we show that finding the optimal base station scheduling is NP-hard, and formulate the BASICS (BAse Station Inter-Cell Scheduling) algorithm, a novel heuristic to approximate the optimal solution at low complexity cost.

What happens when all base stations are allocated?

When all base stations are allocated, the algorithm ends returning the complete base station scheduling plan. One of the key parameters upon which BASICS relies is the SINR threshold  $T_h$ , i.e., the minimum SINR guaranteed to each scheduled user in the system.



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### EP3804182A1

Techniques and apparatuses are described for enabling base stations (121, 122) to coordinate for canceling cross-link interference (380). The techniques and apparatuses described herein ...

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### On the Value of Coordination and Delayed Queue ...

A key insight is that sharing delayed queue-length information enables coordination on a slow timescale among the base stations, and this permits each base station to use limited and local ...



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### Joint Shared Relaying and Base Station Coordination in LTE ...

This paper focuses on Base station coordination and relaying techniques. Base station coordination is an advanced variant of MIMO as a means of mitigating the inter-cell ...

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### Base Station Coordination in Multicell MIMO Networks

One efficient technique to combat intercell interference is via exploiting coordination among multiple base stations, which is known as multicell processing or simply base station ...



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### **Base Station Coordination Scheme for Multi-Tier Ultra-Dense ...**

Base Station Coordination Scheme for Multi-Tier Ultra-Dense Networks Published in: IEEE Transactions on Wireless Communications ( Volume: 20, Issue: 11, November 2021 )

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### **WO2020185748A1**

Techniques and apparatuses are described for enabling base stations (121, 122) to coordinate for canceling cross-link interference (380). The techniques and apparatuses described herein ...

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### **US10797749B1**

Techniques and apparatuses are described for enabling base stations ( 121, 122 ) to coordinate for canceling cross-link interference ( 380 ). The techniques and apparatuses ...

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## Improving Base Station Coordination Based Packet Scheduling

e group allows only one base station to transmit at a time. As a result of time orthogonality in transmissions, the co-channel nterference and hence the packet error rate can be reduced. ...

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## Base Stations

They come in various types such as omnidirectional or sector antennas responding to diverse coverage needs. Controller and processor: ...

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## Base Station Coordination Scheme for Multi-tier Ultra-dense ...

In this paper, we consider a relative received link power (RRLP)-based coordinated multi-point (CoMP) joint transmission (JT) in the multi-tier ultra-dense networks (UDN). In this CoMP ...

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## BASICS Scheduling Base Stations to Mitigate Interferences ...

on the optimal user schedu g excessive interference to any of the users of other scheduled base stations. To this aim, we show that finding the optimal base station scheduling is NP-hard, and ...

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## Base Station Coordination Scheme for Multi-Tier Ultra-Dense Networks

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## Coordination of Macro Base Stations for 5G Network with User ...

The coordination among the communication equipment and the standard equipment in 5G macro BSs is developed to reduce both the energy consumption and the electricity costs.

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## On the Need for Coordination Among Base Stations in a ...

In this paper, we presented a flow-based unified optimization framework for the joint optimization of resource allocation, user scheduling and user association under the optimal ON-OFF ...

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## Coordinated Multipoint Transmission and Reception

Coordinated Multipoint (CoMP) transmission and reception comprises a series of schemes that a user equipment (UE) is served simultaneously by several points to enhance ...

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## Base Station Coordination towards an Effective Inter-cell ...

networks is becoming a serious concern for the next generation wireless networks. This paper proposes Base Station Coordination as a promising solution o tackle Inter-Cell Interference ...

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## Joint Shared Relaying and Base Station Coordination in LTE ...

In order to achieve high spectral efficiency with improved peak data rates of cell-edge uses and enable an enhanced network coverage with good throughput both in downlink and uplink, LTE ...

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## [WO/2023/146011 ?BASE STATION COORDINATION APPARATUS](#)

The present invention provides a base station coordination apparatus. The apparatus establishes a connection between a base station and distributed antenna system, and comprises a power ...

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## Adaptive load balancing in LTE-Advanced networks with base station

Load balancing (LB) in LTE-Advanced networks with base station coordination is investigated here. Base station coordination allows distributed base stations to act as a single multi ...

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## Base Station Coordination Scheme for Multi-tier Ultra-dense ...

cooperation among multiple BSs to transmit the information to users. Such transmission includes the dynamic point selection (DPS) [18], the coordinated schedu.

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## Base Station Coordination Scheme for Multi-Tier Ultra-Dense ...

In this paper, we consider a relative received link power (RRLP)-based coordinated multi-point (CoMP) joint transmission (JT) in the multi-tier ultra-dense networks ...

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## Base Station Coordination Scheme for Multi-tier Ultra-dense ...

The simulation results show that D 2 CP and D 2 CP-C outperform fixed channel partitioning by 33.37% and 76.01%, respectively, demonstrating that base station coordination and cross-tier ...

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## US20200295800A1

Techniques and apparatuses are described for enabling base stations ( 121, 122 ) to coordinate for canceling cross-link interference ( 380 ). The techniques and apparatuses described herein ...

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## Inter-Operator Base Station Coordination in Spectrum ...

Inter-Operator Base Station Coordination in Spectrum-Shared Millimeter Wave Cellular Networks Jeonghun Park, Jeffrey G. Andrews, and Robert W. Heath Jr. Abstract

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## Base Stations

They come in various types such as omnidirectional or sector antennas responding to diverse coverage needs. Controller and processor: These components manage the ...

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## Joint Shared Relaying and Base Station Coordination in LTE ...

Base station coordination is an advanced variant of MIMO as a means of mitigating the inter-cell interference and hence improves spectral efficiency of cell border users where performance is ...

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