
Why do we need a 5G base station?
The limited penetration capability of millimeter waves necessitates the deployment of significantly more 5G base stations (the next generation Node B,gNB) than their 4G counterparts to ensure network coverage. Notably,the power consumption of a gNB is very high,up to 3-4 times of the power consumption of a 4G base stations (BSs).

How does 5G ran work?
In 5G-RAN,the gNB systems within designated areas are combined into gNBs-clusters by aggregators. All gNBs-clusters are powered by the power system plane through power feeders,so switching the modes of a certain number of gNBs (sleep/active) and BESSs (charge/idle/discharge) can alter the power injection of the power system.

How a 5G network can support a power system?
The 5G network and power system are coupled energetically by power feeders. Based on gNB-sleep actions and mode switching of their BESSs,5G network can provide power support to the power system when the grid frequency deviation reaches the threshold.

What is a 5G network?
The 5G network plane consists of three layers: 5G-CN, 5G-TN, and 5G-RAN. The servers in 5G-CN operate as a centralized controller while 5G-TN is responsible for the bi-directional transmission of information. In 5G-RAN, the gNB systems within designated areas are combined into gNBs-clusters by aggregators.

In this paper, a comprehensive strategy is proposed to safely incorporate gNBs and their BESSs (called "gNB systems") into the secondary frequency control procedure. Initially, ...

To ensure the safe and stable operation of 5G base ...

Therefore, this paper proposes a two-stage robust optimization (TSRO) model for 5G base stations, considering the scheduling potential of backup energy storage. At the day ...

A case study is conducted to analyze the impact of the critical factors on the load of 5G BS and the influence of 5G BSs load on the other loads in three typical areas.

The power consumption of a 5G single station is 2.5 to 3.5 times that of a 4G single station due to AAU power consumption, the ...

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The power consumption of a 5G single station is 2.5 to 3.5 times that of a 4G single station due to AAU power consumption, the current full load power of a single station is nearly ...

How to lay 5G base stations in all areas according to the load distribution characteristics of base stations in differentiated scenarios is a key step to realizing the 5G ...

To ensure the safe and stable operation of 5G base stations, it is essential to accurately predict their power load. However, current short-term prediction methods are rarely ...

In this paper, hourly electric load profiles of 5G BSs in residential, shopping, and office areas for future 5G application are simulated to compare and investigate their characteristics based on ...

To further explore the energy-saving potential of 5 G base stations, this paper proposes an energy-saving operation model for 5 G base stations that incorporates ...

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