

# Coordination and load analysis of C-RAN in HetNets by graph-partitioning

J. M. Sánchez, M. Toril, C. Gijón, S. Luna-Ramírez, M. Fernández-Navarro  
{jmsanchez, mtoril, cgm, sluna, mariano}@ic.uma.es

In 5G systems, ultra-dense networks are a promising technique to cope strong increase of traffic data in mobile communications. In addition, the deployment of indoor small cells offloads the wireless system from macrocells at the cost of increasing network complexity. In this work, a method for capacity analysis of Centralized Radio Access Networks (C-RANs) comprising macrocells and small cells is proposed. Radio remote heads (RRH) are grouped to a Base Band Unit (BBU) pools using graph theory techniques. For this purpose, the impact of Inter-Cell Interference Coordination (ICIC) and Coordinated Multi-Point Transmission/Reception (CoMP) techniques on the network is assessed under different load levels and coordination restrictions. Assessment is carried out by using a radio planning tool that allows to characterize spectral efficiency and allocation of shared resources per cell over a realistic Long-Term Evolution (LTE) heterogeneous network. Results show that load and coordination conditions between cells are key to improve system capacity.