



## **Energy Efficiency of Base Station Cooperation Using Amplify-and-Forward Relay Protocol**

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### **Abstract**

Since 80% of energy is consumed in radio access side, advanced deployment strategies such as amplify-and-forward (AF) relay networks were presented to provide special diversity for future mobile communication systems. In this paper, BS cooperation scheme is proposed using AF relay protocol for relatively smaller cells than conventional networks. Here, performance of the proposed scheme outperforms both direct transmission and relay cooperative protocols in such a way that, it consumes lower transmission energy than AF for both source and relay nodes. Furthermore, impacts of distance dependent path loss and log-normal shadowing on the performance of proposed scheme are examined and compared to the available schemes such as AF relay networks. Finally, advantages of using fixed and optimal power allocation for base station cooperation schemes are examined and compared to AF relay cooperative networks. It was observed that BS cooperation scheme results in almost 67.64% reduction in  $\mu$ joules/bit, for both uplink and downlink modes at the worst case. Hence, less power will be consumed to combat fast variations in channel conditions such as log-normal shadowing effect.

### **Biography**

He obtained My BSc degree in Electrical Engineering (Electronics and Communications) in University of Sulaimani in 2008. He worked in University of Sulaimani, Electrical Engineering department as Instructor in the Labs for the duration of two years. Later, He obtained my MSc degree from University of Surrey in Mobile and Satellite Communications Engineering in 2012. In 2013, He joined the Faculty of Engineering at the University of Sulaimani as a Lecturer in Electrical Department Academic Staff.