

Energy-aware subchannels power allocation for downlink transmissions in OFDMA systems

ABSTRACT

It is arbitrarily known that the spectrum scarcity issue in the wireless channel has brought to the surface several Quality of Service (QoS)-related challenges for the network operators. Although it is claimed a QoS improvement may be possible if a high wireless signal frequency is generated, this solution does not seem to be compatible with the emerged network scenarios, wherein low power and energy-efficient communications are among the core driving QoS criteria. Minding that, in this paper, we look into the problem of subchannel power allocation at the downlink LTE-A network. Accordingly, an Energy-aware Subchannels Power Allocation (EaSPA) algorithm is proposed to solve the formulated non-convex optimization problem. The system-level simulation experiments imply that the proposed subchannels power allocation model enhances the energy efficiency by 20% compared with a reference scheme. In addition, a low dissipated power level is preserved over different network loads.

Keyword: LTE-A; QoS; Sub-channels power allocation; Non-convex optimization; Energy efficiency; System capacity