

## 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