# Energy-Efficient Sleep Mode Analysis and Optimization

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**Abstract**

In wireless communications mobile station battery power is an important resource because it is limited. Therefore nowadays power saving technologies are one of the constitutive issues during emerging wireless broadband networks development and implementation. There are many ways to reduce energy consumption of a mobile client station throughout various layers. At MAC layer a key technique is sleep mode. The main idea of this approach is mobile client station turns its receiver off when there is nothing to receive. However, together with the reduction in the power consumption the mechanism leads to transmission delay increasing. Therefore both characteristics must be taken into account (energy efficiency and quality of service parameters) in scope of the sleep mode analysis. In the research we present an analytical approach that contains simple enough equations to estimate energy efficiency and mean delay in the case of the sleep mode operation. Also we provide some recommendations to control sleep mode parameters.