

# **Optimizing wireless access networks towards both power consumption and electromagnetic exposure of human beings**

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## **Abstract:**

In the last few years, the worldwide use of wireless devices has grown considerably. Laptops, tablets, smartphones, etc. have entered into our daily life. Due to this growth, wireless access networks have also been expanding significantly in order to serve all mobile users. However, wireless access networks, and more specifically the base stations of these networks, are currently already very large power consumers. As it is expected that the amount of wireless devices, customers, and traffic will further increase in the coming years, it is very important to develop and implement energy-efficient wireless access networks in the near future. In addition to this, people are becoming more and more concerned about the health effects that can be caused by the electromagnetic radiation of these networks; so on the other side, it is also important to minimize the exposure of human beings to these networks.

In this TD, the capacity-based deployment tool we developed for developing wireless access networks with a minimal power consumption is further extended to take also human exposure to electromagnetic fields of base stations into account. First, we propose an approach to minimize power consumption while satisfying a certain exposure limit. Second, an approach to minimize the exposure of human beings is proposed and finally an algorithm for optimizing towards both power consumption and exposure of human beings is introduced.