Contribution ID: **3** Type: **Poster**

Numerical simulation of the human eye exposition to high-frequency electromagnetic field

Thursday 12 September 2024 12:00 (20 minutes)

In this study, we aim to create a model of the human eye and antenna to simulate the impact of high-frequency electromagnetic fields (EMF) on it. Our objective is to compare the calculated results with the current legal limit values for high-frequency EMF and their interaction with the tissues of the human eye.

We utilize assembled simulation models that combine specifically designed dipole antennas and eye models with frequency-adapted dielectric properties. These simulations calculate the maximum values of electric intensity, magnetic intensity, and SAR (Specific Absorption Rate) coefficient to compare how these values change as the antenna moves away from the human eye.

We carried out thirty-two simulations to analyze the effects of four different operating antennas on the eye model at eight different distances from the eye. SAR measurements were performed using a cubic volume element of 3 grams, as the measured element must be smaller than half the volume of the eye. We initiated the calculations with the antenna positioned 1 cm from the eye and then measured subsequent distances at 2 cm intervals up to a final distance of 15 cm. The calculated electric intensity, magnetic intensity, and SAR coefficient values were compared to the maximum limit values.

Author: Mrs PSENAKOVA, Zuzana (University of Zilina)

Co-authors: GOMBÁRSKA, Daniela; LAUKO, Lukas

Presenter: Mrs PSENAKOVA, Zuzana (University of Zilina)

Session Classification: Session 5 - Poster Session A