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POSTER

PLATFORM PRESENTATION

Volume-Averaged SAR in Adult and Child Head When Using a Mobile Phone – Computational Study with Detailed CAD-Based Models of Commercial Mobile Phones

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Previous computational mobile phone EMF exposure studies comparing SAR difference in the head of children and adults have used highly simplified models of a mobile phone as an EMF exposure source, such as a half-wave dipole antenna or a rectangular conductive box with monopole or helix antenna. The objective of this study was to investigate the SAR difference in the head of children and adults using realistic EMF sources based on accurate CAD models of commercial mobile phones.

Four MRI-based head phantoms were used in the study, two child and two adult head models. CAD models of Nokia 8310 and 6630 mobile phones were used as exposure sources. Commercially available FDTD software was used for the SAR calculations. SAR values were simulated at frequencies 900 MHz and 1747 MHz for Nokia 8310, and 900MHz, 1747 MHz and 1950 MHz for Nokia 6630.

The main finding of this study was that the SAR distribution/variation in the head models highly depends on the phone model used as exposure source, which suggests that the type of the exposure source should be taken as an important parameter in EMF exposure studies. Use of a simplified EMF source may lead to non-justified conclusions regarding specific exposure scenarios. The previous findings regarding significant role of the anatomy of the head, phone position, frequency, local tissue inhomogenities and tissue composition specifically in the exposed area on SAR difference were also confirmed. From a volume averaged SAR point of view, no systematic differences between child and adult heads were found.