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POSTER

PLATFORM PRESENTATION

Fetal Exposure To Magnetic Fields Produced By Induction Hobs

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Induction hobs are becoming increasingly common in households due to their efficient energy use and conveniently fast cooking times. The currently valid standards for such household equipment require the fields produced by the devices to be below the reference levels from the 1998 ICNIRP Guidelines at a distance of 30 cm from the front of the device, averaged over an area of 100 square centimetres. While some data published on the exposure of adults suggest that induced currents in the trunk are below the basic restrictions of the 1998 Guidelines, estimation of the fetal exposure to such fields is currently lacking. We built a numerical model of an induction hob and validated it with measurements with a Narda ELT-400 instrument. Good agreement was obtained. We then used a model of a 30 weeks pregnant woman to calculate the induced currents and induced electric field in the fetus, uterus and placenta and compared the results to the 1998 ICNIRP Guidelines as well as the 2010 Low frequency Guidelines. The results show that the exposure of the fetus is below the basic restrictions for induced current as well as induced electric fields, even with the magnetic field increased by a factor of 5, which can happen during normal operation due to inappropriate or misaligned cookware. Namely, the maximum induced electric fields in were 0.171 V/m in the fetus, 0.206 V/m in the placenta, 0.292 in the uterus and 0.608 V/m in the body of the mother. The maximum induced currents were 0.046 A/m² in the fetus, 0.114 A/m² in the placenta, 0.100 A/m² in the uterus and 0.184 A/m² in the body of the mother.