Neurological effects on cell phones: Literature review and mathematical models

Efectos neurológicos por teléfonos celulares: Revisión bibliográfica y modelos matemáticos

López, Ernesto Ponce

Saldías, Daniel Ponce

Hernández, Max Andresen

The electromagnetic radiation emitted by mobile phones and base antennas can penetrate tissues of the human head, and can be absorbed and transformed into heat. Due to the increase of mobile telephony, there is interest in studying its effects on human health. An analysis of the medical literature from 1996 to 2013 was carried out through internet searches using Medline and PubMed. Using mathematical modeling, the effect of 0.9GHz frequency was studied. The finite difference model was used to predict specific absorption ratios in W·m-2. The finite element model was based on a horizontal section of a 10 years old child head at eye level. Two dimensional analysis and a minimum thickness were used. The finite difference model predicted specific absorption ratios reaching 0.72W·m-2, while 2.0 is admitted by the European Union. Calculations of absorption obtained from finite element predictions (to determine the displacement of the electric field) showed a better match for the 2009 version