

## MAGNETOPHOSPHENE PERCEPTION AND ASSOCIATED NEUROPHYSIOLOGICAL RESPONSES OF THE HUMAN CENTRAL NERVOUS SYSTEM EXPOSED TO 50 AND 60 HZ MAGNETIC FIELDS OF UP TO 50 MT

In the Extremely Low Frequency range (ELF), international guidelines on magnetic field (MF) exposure are based on acute 'well-established effects' on the human central nervous system, characterized by the best estimate of retinal magnetophosphene perception threshold. Magnetophosphenes are described as 'flickering-lights' perceived in a dark environment when exposed to a sufficiently strong time-varying MF. Although magnetophosphenes are the most robust exposure-related established effect, the perception threshold at power frequencies (50 and 60 Hz) remains uncertain, since it is based on extrapolated estimates from non-replicated experimental data acquired at lower frequencies. This project is therefore aiming to supplement the results from the literature regarding exposure in the milliTesla range at power frequencies with reliable MF exposure thresholds systematically inducing effects in humans and with plausible mechanisms of action. The main specific objective here is to experimentally test the magnetophosphene detection threshold in humans exposed to MF flux densities between 0 and 50 milliTesla at 50 and 60 Hz. The electrical activity of the brain (electroencephalographic - EEG) and the physiological tremor responses are also investigated. This project is in its early stages, and only preliminary data confirming that the magnetophosphene perception threshold is actually below 50 milliTesla at 50 and 60 Hz, and that human EEG and physiological tremor can be recorded during the exposure periods, are presented here. When completed, this project will provide accurate MF flux density exposure thresholds measured in humans at 50 and 60 Hz systematically inducing magnetophosphene perception and associated changes in EEG, as well as potential physiological tremor and associated EEG changes.