

Hazardous ULF electromagnetic environment of Moscow city

G.G.Belyaev¹, V.M.Chmyrev², N.G.Kleimenova²

¹ *IZMIRAN, Troitsk Moscow region*

² *Institute of the Earth Physics, Moscow*

The first magnetic measurements of the industrial noises in ultra low frequency (ULF) range (0.1-10 Hz) have been done at several locations in center of Moscow, in the capital outskirts and suburbs. The natural electromagnetic environment at these frequencies includes the geomagnetic oscillations of Pc1 type ($f \sim 0.5-2$ Hz) and the first mode (~ 8 Hz) of Schuman resonance of the Earth-ionosphere cavity. This frequency range is the most biologically important because its lower part coincides with the principal frequency of the human heartthrob ($f \sim 0.5-1.0$ Hz) and its higher part coincides with the brain α -rhythm. There were many papers, which have demonstrated significant effects of strong ($H > 1.5$ nT) magnetic field oscillations at these frequencies to the unspecific reaction of living organisms and man. It is found that in center of Moscow the level of technogenic magnetic fields at the frequencies ~ 0.5 Hz reaches about 250-300 nT. That is as large as more then three orders of Pc1 geomagnetic pulsation maximum amplitude. The magnitude of the magnetic noise at 8 Hz in Moscow center is about 1 nT that exceeds the natural oscillations at this frequency ~ 100 times. Level of the magnetic noises at the outskirts of Moscow and in industrial parts of Podolsk city is 10 to 15 times lower. Very high level of technogenic ULF magnetic field oscillations in megapolis causes concern about their possible hazardous effects on a health of citizens and stimulates deployment of extensive research program in this area.