On the ñunreasonableò effects of ELF magnetic fields upon a system of ions

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Abstract

A recent experiment on a physical, nonbiological system of ions at room temperature has proved that microscopic ion currents can be induced by applying simultaneously two parallel magnetic fields, one rather weak static field, $\vec{B}_0$ and one much weaker alternating field, $\vec{B}_{ac}$, [$B_{ac} \sim 10^{\tilde{\imath}\,3} B_0$] whose frequency coincides with the cyclotron frequency $\upsilon = qB_0/2\pi m$ of the selected ion. As a result, ionic bursts lasting up to 20 s and with amplitude up to 10 nA arise. The much larger exchanges of energy induced by thermal agitation (the ñkT-problemò) appear to play no role whatsoever. We have analyzed this problem in the framework of coherent quantum electrodynamics, reaching the following conclusions: (a) as has been shown in previous articles, water molecules in the liquid and solute ions are involved in their ground state in coherent ordered configurations; (b) ions are able to move without collisions among themselves in the interstices between water coherence domains; (c) because of coherence, ions can follow classical orbits in the magnetic fields. A full quantitative understanding of the experiments is thus reached.