



Problem of Identity of Acoustic and Electromagnetic Emission Area

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It is well-known that some electromagnetic emission and acoustic nose with very low frequency (VLF) are fixed before earthquake quite often. In other words electromagnetic and acoustic emissions take place and the main rezone of it is the changes in tectonic stress in area of future earthquake.

These two events is very different from physical point of view and are considered as the most effective indicators from possible earthquakes precursors. In spite of qualitative differences there is relationship between electromagnetic and acoustic waves definitely. This is revealed in many effects. One example is emission of magnetospheric - ionospheric very low frequency and ultra low frequency (ULF) that are fixed as in electromagnetic so in acoustic records.

The main goal of this work is to understand the mechanisms of electromagnetic and acoustic emissions from the Earth to show possible common mechanical mechanism of their generation. For this we will consider the model. The main basement of this model is assumption of existence of some small cavities in the zone of future earthquake source. This means that the Earth is not the uniform environment, but it is the porous electro conductive one, where exist some dielectric clusters like bubble marks. From physical point of view this can compare to water and rubber. It is known that in the water exist some small bubble marks. Hydro location principle is based exactly on existents of this one. The basement of this principle is resonant amplification of acoustic waves. But except amplification is possible converse effect – decay of sounds. This phenomenon is obvious on the example of rubber isolator that contains the air clusters like water. In this case clusters are generator of acoustic waves with vice versa phase. They perform screening of acoustic waves by superposition with outside noise.

We permit that generation of electromagnetic and acoustic waves will be generated in the same volume. In this case the character of acoustic waves has to be determined by equation of mechanical resonator.

$$\omega = \frac{V_1}{2\pi} \cdot \sqrt{\frac{S}{VL}} \quad (1)$$

where V_1 is sound velocity, S is the square of section of analog acoustic resonator throat L is the character length of resonator, V is volume.

So, presented model shows possibility of simultaneous generation of low frequency acoustic waves and electromagnetic wave with 1 -100 Megahertz. For qualitative analysis and rough quantitative estimation it is permitted existence of air cluster with small size (10^2 sm) in earth crust where acoustic and electromagnetic resonator can function simultaneously.

Based on the above imaginations there are revealed local places in the territory of Georgia where emission of acoustic waves may take place before earthquakes occurring.