# SCALE INVARIANCY OF GEOELECTRIC PARAMETERS

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The Earth's crust is medium of propagation of electromagnetic waves. Is represents hierarchical structure that consists of blocks decreasing on the sizes, starting from large megablocks and finishing various local structures. Together with medium the hierarchical structure is shown also with distribution of electric parameters (conductivity $\sigma$ and dielectric permeability $\varepsilon$ ). Experimentally such behaviour for conductivity as sedate dependence on the size of area is revealed in Krylov's and Lubchich's work [1]. Similar sedate dependence should be observed and for dielectric permeability. In the report it is shown, as it is possible to receive scaling dependence between electric and geometrical parameters, proceeding from scale invariant of the Maxwell equations.

At scale transformation of a trajectory of movement of material bodies and fields to which electromagnetic waves concern also, pass in other, similar trajectories. Thus the coordinates, described radius - a vector $\bar{r}$ and time *t*, pass in new values $r'$ and $t'$, connected as follows [2]:

$$r' = \lambda r, \; t' = \lambda^{h} t \tag{1}$$

Excepting parameter $\lambda$ , it is possible to receive

$$r \sim t^{1/h}. \tag{2}$$

This one of base equation fractal geometry [3] where *r* represents the linear size of area filled fractal with object in time *t*. The parameter *h* carries the name of dimension of wandering. For the first time the law (2) with a parameter $h = 2$ at an explanation brown movements Einstein has received. Then Richardson [4] and Kolmogorov [5] at the description of turbulence have found $h = 2/3$. The structure of a polymeric circuit is characterized $h = 5/3$ (Flori, [6]).

It is obvious, that after scale transformation (1) similar sedate image should vary and components of an electromagnetic field. Then from invariant of the Maxwell equations it is received the following transformations for electric parameters:

$$\varepsilon' = \lambda^{2(h-1)}\varepsilon, \; \sigma' = \lambda^{h-2}\sigma. \tag{3}$$

For example, combining (3) with (1), we find $\sigma \sim r^{-(2-h)}$. Comparing with results of the measurements which have been carried out in [1] we receive $h = 0.53$.

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References

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