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The first (mainly used) model for VES method is based on horizontally layered structure. The second one includes different deep objects, such as faults, horsts, grabens, domes, etc. We introduce the third model, which includes horizontal layers, deep objects, and many subsurface objects of different resistivities, referred to as *subsurface inhomogeneities* (SSIs). Two items must be taken into account: 1) SSIs are not interesting for us, while deep objects are; 2) there is no possibility to describe all SSIs correctly in final model, because these will need too much modeling resources. At the same time the influence of SSIs may be very high, because these they are close either to current sources or to field measurement points. Distortions, caused by SSIs may be compared with those, which appear when you look through fractured glass or swelling sea surface on the objects beneath. SSIs may greatly distort VES curves and the effect of deeper structures becomes unrecognizable. The only way to overcome SSI distorting influence on VES is to remove these from field data. The process includes three steps: 1) special field procedure (two-sided pole-dipole array with a linear step of sounding distance) to register data with effects of SSI and deep objects, 2) data processing for visualization of SSI influence, and 3) process of removing these effects from field data.

VES distortions caused by SSI may be divided into two groups;
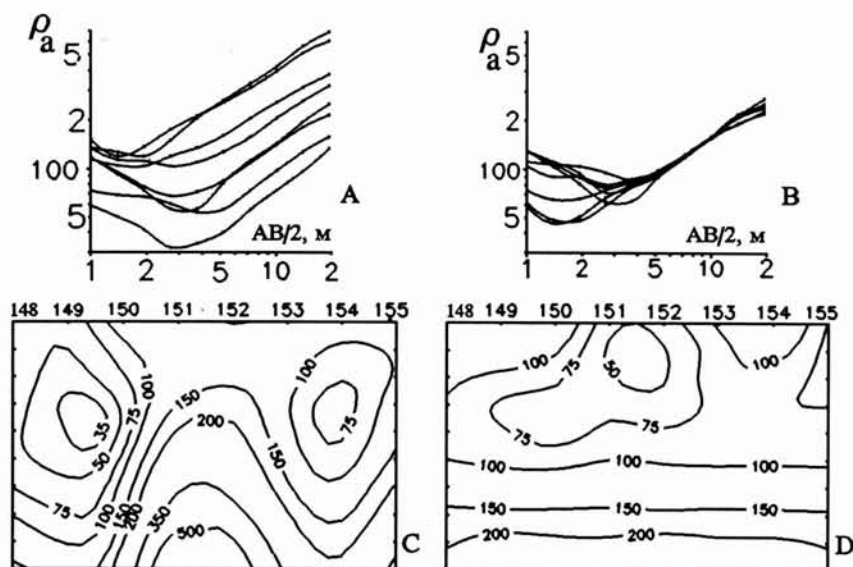

Fig.1. S-effect on VES curves, measured in archaeological VES site Krasnoe.

SSIs near measuring electrodes (S-effect) and near current electrodes (C-effect). We recognized that more than 70% of VES curves are distorted by SSI effects and especially by C-effect. S-effect moves VES curves up and down along ρ_a axes without changes in their form and ρ_a pseudo-section looks like wavered structure (fig.1,C). Step between VES's in fig.1 is equal to 1 meter. That means that differences between VES curves resulted from distortions, and not from real deep structure. After shifting all VES curves to a single ρ_a level (fig.1,B), ρ_a pseudo-section becomes horizontal (fig.1,D) and interpretation gives horizontal boundaries.

C-effect is more dangerous, because it changes form and visible layers' number on VES curve. Fig.2 (A-E) shows C-effect on a model (E). On fig.2,D are shown two VES-AMN curves for locations 1 and 2 on 2,E. When electrode A is moving from sounding center 2 to the left, it crosses inhomogeneity and a strong distortion of VES-2 curve appears. It results in changes in the form of VES curve and makes correlation between VES curves much more difficult. Visually on ρ_a and more distinctly on vertical derivatives $\partial\rho_a/\partial r$ pseudo cross-sections (fig.2, A,B) some bands and strips of distortions appear, being inclined to the right for AMN and to the left for MNB. C-effect may be erased in the course of data processing (fig.2,C), and VES-data becomes ready for correct 1D or 2D interpretation.
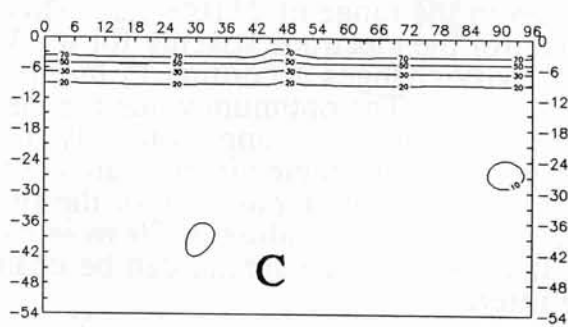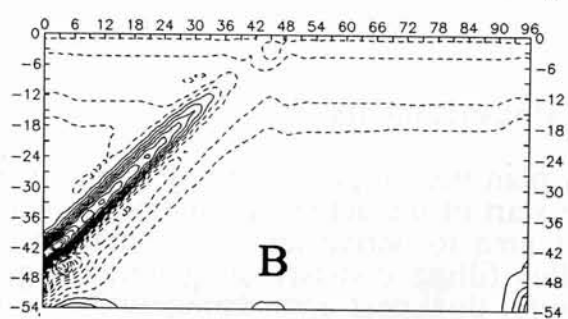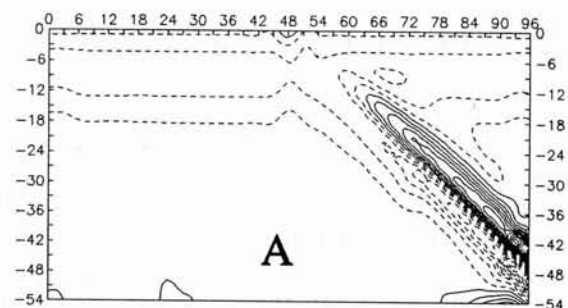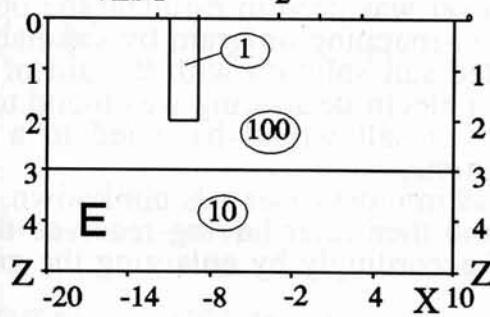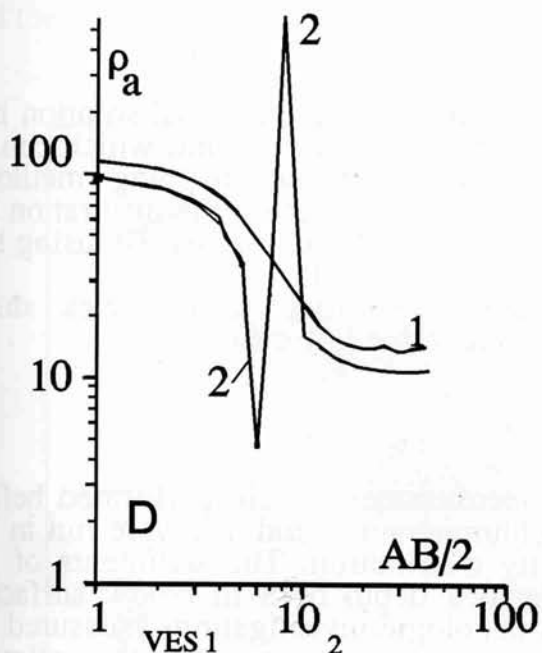

Fig.2. C-effect on model.