363 Ma). In this approach the digital simulation of whole DDB region showed that after initial stretching and mantle thermal load the set of blocks became active over a period of 12 Myr.

Fig. 1 shows locations of test in presentation seismic reflection profiles Zachepilovka — Belsk (*1*) and Mikhailovka — Prokopenki (*2*) in the central part of the DDB according to geophysical observations. The mathematical 2D dynamic and thermal model is 140 km in length and 120 km deep and comprises three layers — 'granite', 'basalt', and mantle — with appropriate thermo-physical parameters. Fig. 2. shows the initial 'granite' and 'basalt' layers of blocks that have been built according to Zachepilovka — Belsk profile interpretations. Model results are shown in Fig. 3. as evolution of the sedimentary basin basement horizon along the Zachepilovkav — Belsk profile.

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Possibilities of seismic migration for interpretation of wide-angle reflection/refraction profiles

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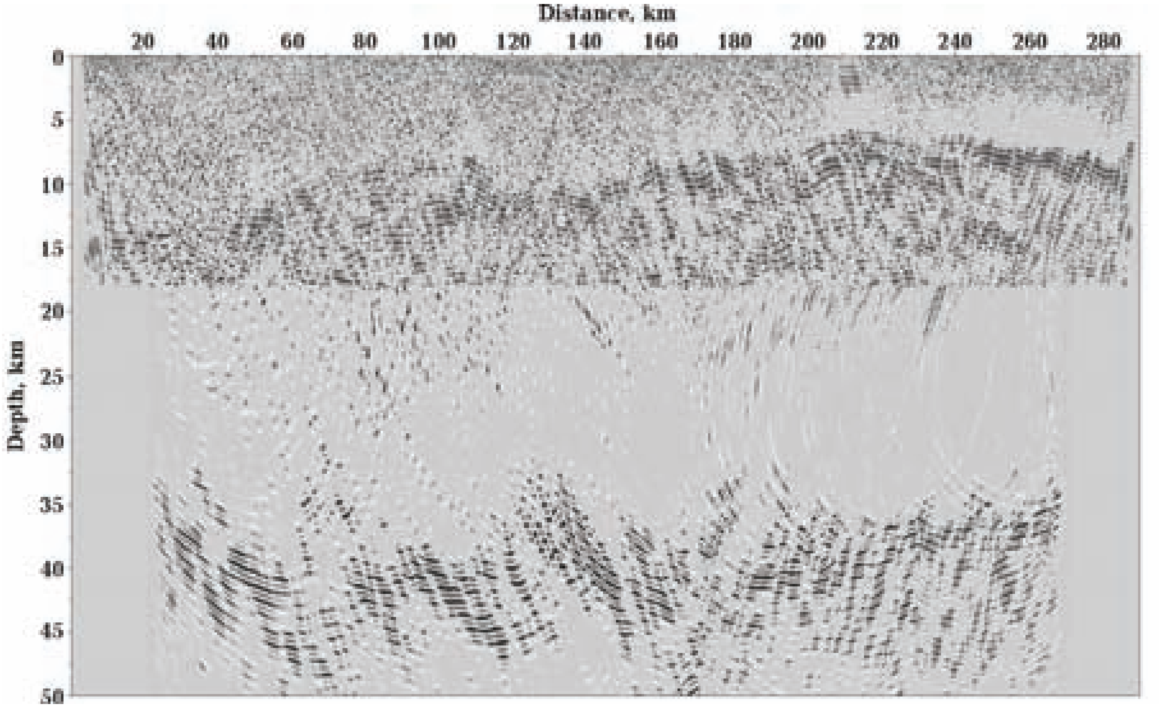
The migration of observed wave field is key procedure of processing and interpretation of seismic materials as gives the chance to receive an image of a deep section of investigated area where boundaries of environment and feature of their structure are accurately traced. At present there are a considerable number of variants of wave field migration transformations, but one of the most important problems still is involving in process of migration of the wave field recorded at wide-angle observations.

The traditional method of reflected field migration is used successfully for that part of a wave field which is received in rather small distant from a source. At rare and irregular observation system the more stability image of environment can be received with application of finite-difference reverse time depth prestack migration [Pilipenko et al., 1999].

The refracted waves dominate in a distant part of a wave field, from a source. In seismic prospecting, at interpretation under the refracted waves frequently understand waves which conform to theories of head wave propagation sliding along refracting border and thus not penetrate into refracting thickness. Such understanding of the refracted waves mismatches their real propagation in the environment. However, accounting of their penetration into in refracting thickness leads to complexities, as in theoretical and practical realization of migration. Thus the main problem of wide application of the refracted diving wave field migration is ambiguity in definition position of wave refraction (that is connected with two points of refraction: a penetration in refracting thickness and an exit from it) as opposed to uniquely fixing of a reflection place for the reflected waves. Therefore, the refracted wave field finite-difference migration, offered by Pylypenko V. N. in the eighties of the twentieth century [Pylypenko, Sokolovskaya, 1990] remains while the unique method which is based on refracted diving waves. The given method of migration provides carrying over of a source from a day surface on a surface of refracting boundary in a point of a wave penetration into refracting thickness and to form the boundary image on a point of an exit of wave in covering layer [Pylypenko, Verpakhovskaya, 2003]. Such approach has allowed realizing a correct method of refracted wave field finite-difference migration. The developed method has been successfully tested on a practical seismic material, observed in different parts of the world [Pylypenko, Goncharov, 2000; Makris et al., 2008; Pavlenkova et al., 2009].

Finite-difference migration of refracted wave field



Depth migration section of seismic data (MONALISA2) from North Sea (the top part of a section is formed with the refracted wave field, and bottom — with the reflected wave field).

is based on continuations of time and wave fields for each shot gather. Thus, the difference approximation of eikonal equation on a special grid which as much as possible corresponds to wave propagation in environment is used for continuation of a time field, and reverse continuation of a wave field is performed via the finite-difference solving of the wave equation with application of a time-spatial grid. Finally, the individual images are stacked to produce a final image. The choice of finite-difference method solution explains its correctness and high stability.

Hereby, at researches the WARRP observation system frequently does not allow generating a full deep section by means of migration of a field of one type of waves. The combined approach of image environment formation where the top part of a section is formed with the refracted wave field (Figure), and bottom — with the reflected wave field can serve as an exit in similar situations. Such approach to migration execution has been successfully tested both on modeling and on practical materials and results make possible to talk about its high efficiency and capacity at studying of areas with different degree of deep structure complexity.

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