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Upper mantle – classic ideas and new insights

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Solicited talk

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The first ideas about the Earth’s structure appeared at the beginning of the 20th century, and from that moment on they were actively supplemented and developed. To date, six main structures are to be highlighted. They differ significantly from each other both in physical parameters and composition.

The upper mantle is one of the main shells with which most of the Earth's tectonic processes are associated, as well as a significant part of convective currents. Classically, the upper mantle is divided into a number of structural elements - the lithosphere, the asthenosphere, the underlying part of the upper mantle and the mantle transition zone. However, due to the rapid growth in the volume and quality of seismological data and the increasing density of the seismic network, the understanding of the upper mantle structure has changed significantly over the past 20 years.

We provide an overview of the evolution of seismological concepts of the upper mantle structure, and also provides confirmation of new ideas of its structure based on experimental data collected in various regions of the East European Platform, as well as the Fennoscandian Shield and other regions of the World.

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