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SDR (Seaward Dipping Reflectors) types in the water area of the Mendeleev Rise, Arctic Ocean

Elizaveta Rodina¹, Anatoly Nikishin², and Ksenia Startseva³

¹Geological Faculty, Moscow State University, Moscow, Russia, (rodina_liza@mail.ru)

²Geological Faculty, Moscow State University, Moscow, Russia, (amnikishin@gmail.com)

³Geological Faculty, Moscow State University, Moscow, Russia, (kfstartseva@gmail.com)

The Mendeleev Rise is represented by an asymmetric uplifted crustal block with strongly rugged by half-graben and horst structures. High-amplitude reflectors similar to SDR (Seaward Dipping Reflectors) were found in half-grabens. Similar structures were found in the Toll and Podvodnikov basins.

The top of the SDR complex is usually relatively well defined and corresponds to the rift-post-drift boundary with an age of about 100 Ma. Small, sharp conical build-ups with a chaotic internal structure are often observed at the top of the SDR – probably submarine volcanoes. There may have been two stages of volcanism. The bottom of the SDR complex corresponds to the top of the acoustic basement (about 125 Ma). The thickness of one wedge is about 1, 5 - 3 sec. The length of distinct wedges in the Mendeleev Rise's area is about 25-50 km, in the Podvodnikov basin's area – 50-100 km.

Several types of SDR have been identified. The first type is identified within the Toll basin and the Mendeleev Rise. This is the most classic type. Wedges of this type are characterized by greater thickness, but less length. Wedges are strongly curved. Several distinct wedges stand out. Distinct wedges overlap each other towards the stretch center and start from one point. SDR have longer wedges and slightly less thickness in the Podvodnikov basin's area. The SDR complex is highly spaced apart. Wedges are less curved. Distinct wedges are located in separate half-grabens and have no common starting point. The reflectors cool down and become brighter in the central part of the Podvodnikov basin, near the axial horst. Both complexes are characterized by probable existence volcanic edifices in the top.

We traced the distribution and direction of SDRs, the bottom of the grabens, the position of probable volcanic edifices and made a map. There is symmetry and logic in the distribution of SDR. In the Toll basin, reflectors fall into each other – from the Mendeleev Rise and from the Chukotka plateau – and meet at a structure reminded of an interrupted rift. The rift is parallel to the Mendeleev Rise and the Chukotka Plateau. We can see at on Magnetic Anomalies Map. This probably corresponds to the central axis of extension of the Toll basin. Oppositely directed SDRs from the Mendeleev Rise and the Lomonosov Ridge meet near a raised block in the Podvodnikov basin. Nature of raised block is not fully understood. We call it axial horst. This uplift is subparallel

to the Mendeleev Rise. This is probably associated with the central extension axis for the Podvodnikov basin.

Mendeleev Rise, Podvodnikov and Toll basins were formed approximately at the same time according to the seismic correlation.

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