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The great Arctic Eocene strike-slip zone Umky

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On the seismic lines acquired in 2011-2020 for the North-Chukchi Sea and East Siberian Sea basins plenty of low-amplitude normal faults is identified. Maximal apparent throw of the faults is 100-200 ms, and occasionally reaches up to 300-400 ms. Dip angles of the faults are often directed towards each other, the resulting flower structure is related to strike-slip tension. For individual faults it is possible to ascertain strike azimuth – near 350° for the North Chukchi basin and near 340° in East Siberian basin. By the seismic data, the faults are distributed within an area of ~1.500 km long- and ~350 km wide.

According to interpretation, the faults activation occurred from 45 Ma to 34 Ma. This time corresponds to a regional tectonic rebuilding, that is observed across all the region. For example, a sharp slowdown of the Eurasian Basin spreading had place then. Formation of the North-Chukchi and East Siberian basins is related to Aptian-Albian (~125 Ma) rifting, that manifested itself on the De Long Islands and the Mendeleev Rise. Isometric form of the basins could indicate the conditions of pull-apart tension. Data of gravity and magnetic anomalies support this assumption – a long linear anomaly of ~285° strike is identified to the North of the Wrangel Island (in Chukchi, the last is called Umkilir – “White Bear Island”). The anomaly is interpreted as regional strike-slip that was formed ~125 Ma. The angle between the strike-sleep and the multiple low-amplitude Eocene faults is about 55-65°. It is possible to relate the low-amplitude faults to the reactivation of the great strike-slip.

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