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The Okhotsk Plate and the Eurasia-North America plate boundary zone.

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The Eurasia-North America plate boundary zone transitions from spreading at rates of $\sim$ 25mm/yr in the North Atlantic, to compression at rates of $\sim$ 5mm/yr in the region of the Okhotsk plate. Because the pole of rotation between Eurasia and North America lies more or less on their mutual boundary, there is a linear change in rate along the boundary, and regions near the euler pole are subject to extremely low deformation rates. The Okhotsk – Eurasia – North America triple junction lies slightly south of the rotation pole, placing the Okhotsk plate entirely in a weakly contractional setting. Regions near the triple junction absorb 1mm/yr contraction. Further south, towards the shoreline of the Okhotsk sea, up to 5 mm/yr contraction may be absorbed within the plate. How shortening is accommodated across the boundary remains an open question. One possibility is wholesale extrusion of the entire Okhotsk plate (or possibly its northwestern corner) along two plate boundary strike slip faults (Eurasia-Okhostk and North America Okhotsk). The problem with this model is that the seismic record does not presently clearly support it, with the largest events distributed both within the plate interior and on its boundaries. This may suggest that instead, the Okhotsk plate, and particularly its north-western end, consists of a series of smaller blocks which shuffle against each other, partially accommodating extrusion, but also permitting some internal deformation and change of shape of the Okhotsk plate itself.

We present analyses of the very sparse seismic record from the region, as well as geometric-kinematic, tectonic models of the possible deformation of northwest Okhotsk to try to better understand the different probabilities of how this slowly deforming plate boundary zone is behaving.