



Rapid rotation of shear-wave splitting at the edge of the Ryukyu subduction zone and its dynamic implications

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Waveforms for intraslab events recorded by ocean-bottom seismometers in the Okinawa trough provide an extended depiction of shear wave splitting pattern in the westernmost section of the Ryukyu subduction zone. At 100-200 km from the western edge of the subduction system, we observed trench-normal fast polarization direction in the back-arc compatible with 2D slab-driven corner flow. Towards the edge, the fast directions are sub-parallel to the trench in the arc and back-arc, and rotate to trench-normal again within 50 km of the edge. Splitting becomes complex observed at land stations in northern Taiwan, showing a dominant component consistent with the Taiwan orogenic fabric. The rotation in the subduction edge zone cannot be explained by a B-type – A-type transition model. The observed pattern may indicate lateral flow propagating from the central segment of Ryukyu along the back-arc axis blocked at the western edge of the mantle wedge by the Eurasian lithosphere. This scenario bolsters previous studies that suggest the significant impact of Eurasian lithosphere on the dynamics of the Ryukyu subduction zone.