Supplementary material for the article `Crustal structure of a rifted oceanic core complex and its conjugate side at the MAR at 5°S: Implications for melt extraction during detachment faulting and core complex formation'

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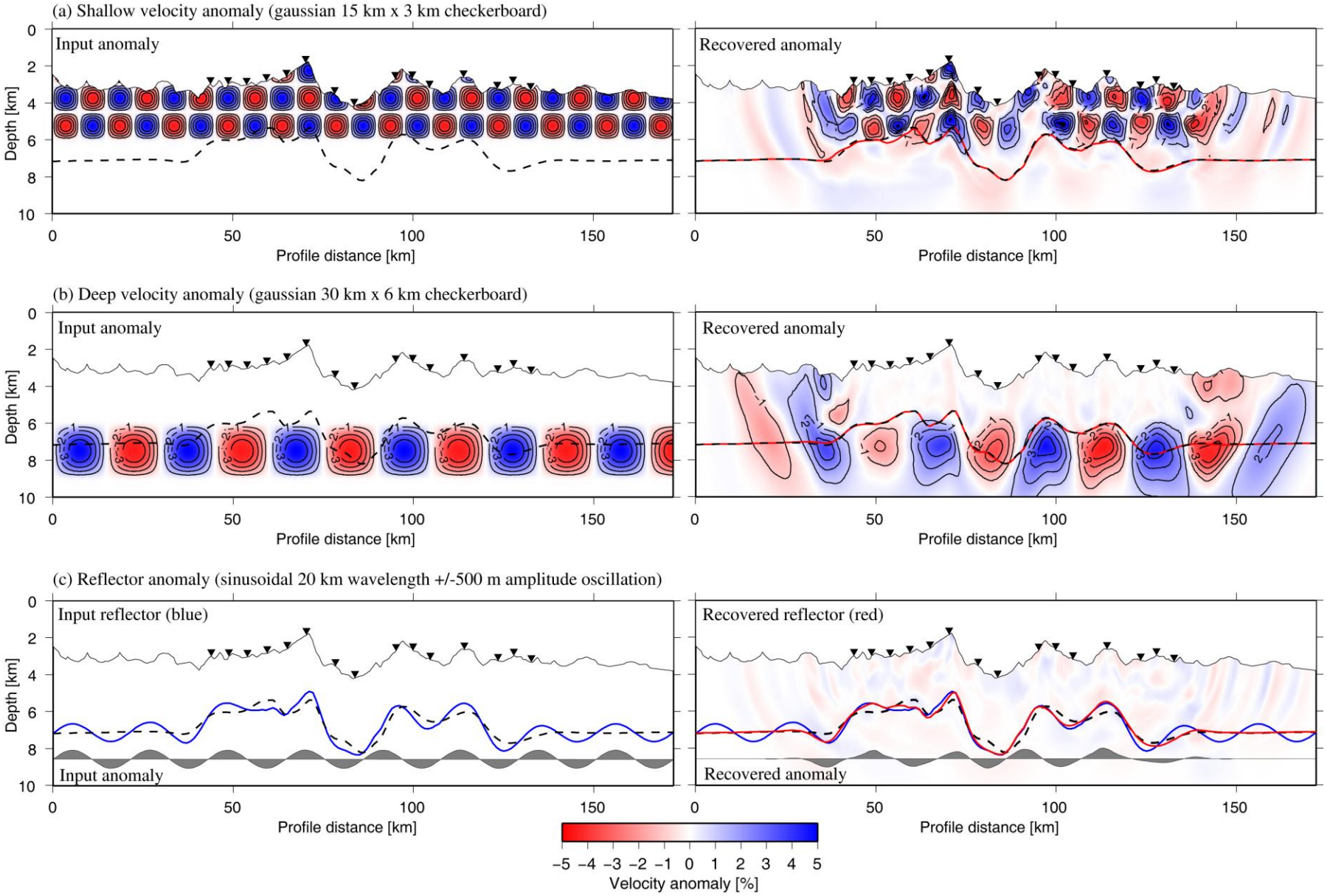
(a) Shallow velocity anomaly (gaussian 15 km x 3 km checkerboard)
Input anomaly
Recovered anomaly
Depth [km]
Profile distance [km]
(b) Deep velocity anomaly (gaussian 30 km x 6 km checkerboard)
Input anomaly
Recovered anomaly
Depth [km]
Profile distance [km]
(c) Reflector anomaly (sinusoidal 20 km wavelength +/-500 m amplitude oscillation)
Input reflector (blue)
Recovered reflector (red)
Input anomaly
Recovered anomaly
Depth [km]
Profile distance [km]
−5 −4 −3 −2 −1 0 1 2 3 4 5
Velocity anomaly [%]

Fig. S1. Resolution test for profile 07/08 using different sets of synthetic velocity and reflector perturbations. Anomalies are imposed on the final tomographic solution shown in Fig. 4a, which also serves as the starting model for the subsequent inversion. Input anomalies and recovered anomalies after 5 iterations are shown in the left and right panels, respectively. (a) Shallow checkerboard comprising +/-5% velocity perturbation sized 15 km x 3 km. (b) Deep checkerboard comprising +/-5% velocity perturbation sized 30 km x 6 km. (c) Reflector anomaly comprising a sinusoidal 20 km wavelength +/- 500 m perturbation. Obtained results demonstrate a rapid loss of resolution accompanied by higher leakage of velocity structure for velocity perturbations placed beyond the area of station coverage. However, a good recovery of velocity and reflector perturbations is proved for the central part of the model which is covered by intrument locations. Here, even for the deeper model portions, there is no evidence for exceeding leakage of velocity structure, neither into adjacent model portions nor into reflector structure.

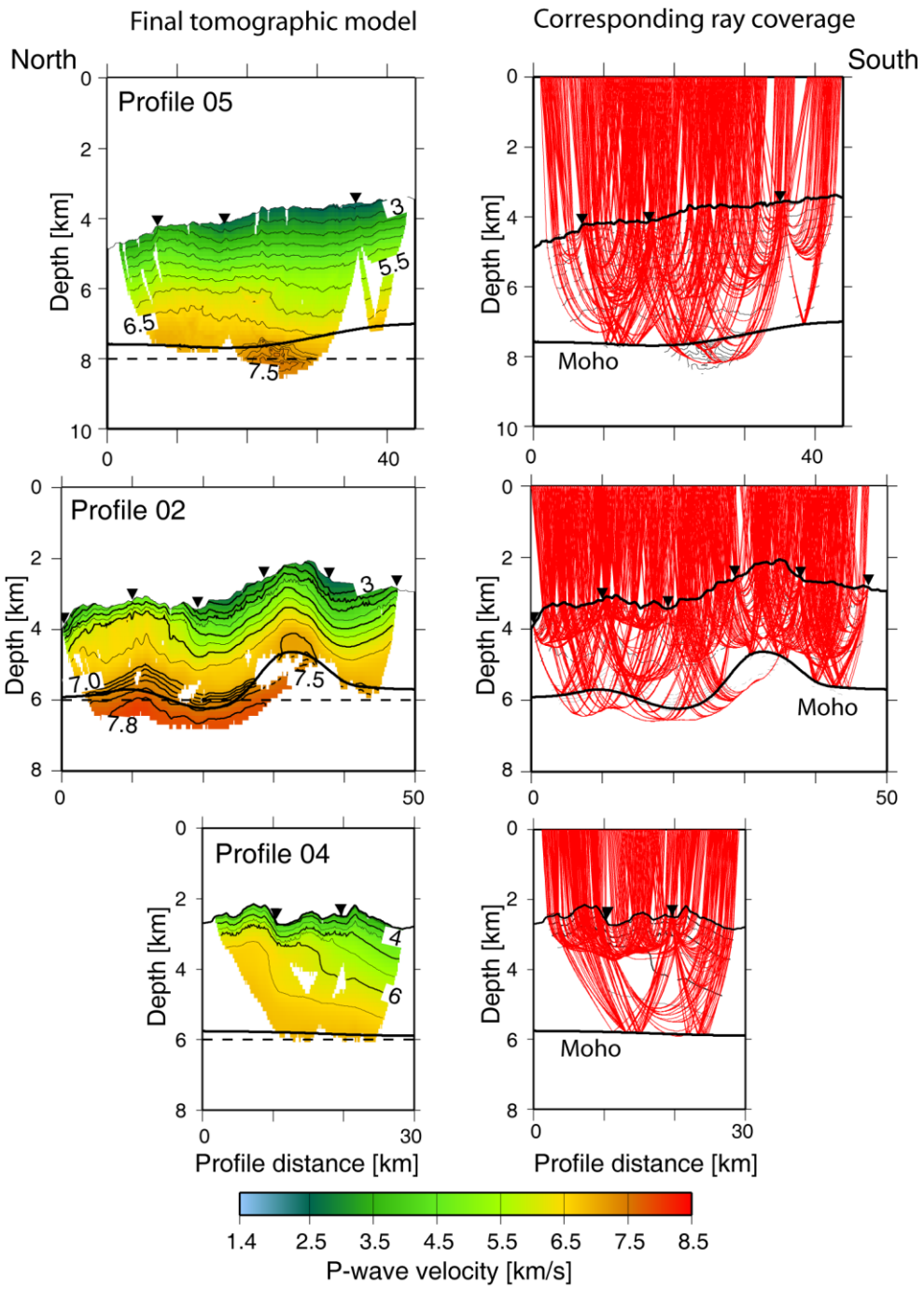

Fig. S2. Ray coverage of the along-axis profiles 02, 04, and 05. The derivative weight sum of profile 09 can be found in Planert *et al.* (2009).