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Tomography of OBS data and prestack-depth migration of MCS data from the Sumatra continental margin

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An MCS streamer profile and a corresponding Ocean Bottom Hydrophone and Seismometer line were acquired offshore Sumatra during RV Sonne cruise 186 in February and March 2006. The 200 km long profile was located east of Simulue Island and directed from the trench in the south-west to the coast of Sumatra in the north-east. Twentyfive Ocean Bottom Hydrophone and Seismometer stations were successfully deployed along the same profile. The OBH/S data were analyzed by first-arrival traveltimes tomography, which leads to a 2D P-wave velocity function between the sea floor and a depth of 15 km below sea level. There are high P-wave velocities at shallow depth in the north-east indicating continental crust and there are lateral velocity variations in the accretionary wedge. This velocity model has been used for a poststack-depth migration of the corresponding MCS line. After filtering the MCS data the subducting oceanic crust can be correlated for a distance of 90 km from the trench landwards. The oceanic crust shows some topography, but it remained unclear if this is an artifact of the velocity model, which might be erroneous in details. This question and the lateral velocity variations in the accretionary prism are further investigated by performing a prestack-depth migration with a velocity and focusing analysis.