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Three-Dimensional Crustal Resistivity Structure beneath Kanchanaburi province, Western Part of Thailand

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Kanchanaburi province located in the western part of Thailand (about 150 km from Bangkok) consists of two major fault zones: the NW-trending Three Pagodas Fault (TPF) and Sri Sawat Fault (SSF) zones. Both have produced large earthquakes in the past according to the paleoseismic studies. Two big earthquakes (5.3 and 5.9) in 1983 on the SSF zone were detected after a year of completion of the big hydroelectric power dam. During the December 2009 to February 2010, thirty nine stations were deployed covering most of the area of Kanchanaburi province and its fault zones. Phase tensor analysis reveals that the data is mostly 3-D. Three-dimensional inversion is therefore conducted with WSINV3DMT with data from 160 Hz to 200 s. Shallow part of the 3-D resistivity structures is consistent with geology of Kanchanaburi. The L-shape conductor producing the phase greater than 90 degree can be observed in the north-western part at mid-depth. Both fault zones can be clearly seen from the 3-D resistivity model. The TPF zone appears to be vertical fault extending deep to the Moho. The SSF zone appears to be a thrust-fault dipping at about 60 degree and end at about 15 km depth. This indicates that the two big earthquakes on SSF were shallow earthquakes and reservoir induced.

Keywords: Magnetotelluric, 3D modeling, Crustal Resistivity Structure, Kanchanaburi