

UNIVERSITI TEKNOLOGI MARA

**CURRENT MOTION OF SARAWAK
(2011 – 2019) – HIGH PRECISION**

MOHAMAD HAIKAL BIN FAIZULAZMI

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ABSTRACT

The configuration of crustal plates in South East Asia is tectonically complicated. The North-West Trench (Palawan Trough) is a part of the most recent subduction zone between the South China Sea and North-West Borneo. Sundaland internal deformation is general very small (less than 7 nanostrain/yr), important accumulation of elastic deformation occurs along its boundaries with fast-moving neighbouring plates. Lack of deformation analytics or analyser in Sarawak is a preclinical problem and it has been revealed that the nation is not ready to confront the natural disaster such as earthquake and landslide. In fact, periodically monitoring of suspicious deformable area has dramatically increased due to the growing concerns to the disasters such as landslides and man-made structural failure. The study was conducted at the entire states in Sarawak. In this project, 14 stations of MyRTKnet located in each of the district in Sarawak. The GNSS data used spans a nine-year period, from 2011 to 2019. GIPSY software was chosen as the finest software to employ for processing in order to achieve high-precision results. In recent days, the velocities of MyRTKnet stations in Sarawak does not exhibits any significant value of extension that exclusively supports a gravity-driven displacement of the entire plate tectonic of Sarawak. Based on the 14 MyRTKnet stations referenced in Sarawak, the observed horizontal velocity magnitudes and directions may be influenced by local motions and although vertical displacements signify downward motion these findings will still be relatively relevant for high uncertainties. Nonetheless, the likelihood of coastal MyRTKnet stations in North-West Sarawak such as MIRI moving towards an extensive invert direction from the main land of 65 Sarawak due to frequently sub-parallel gliding planes are distinguished from razor sharp ones. On many situations, soft clay material can be seen being pushed from the layers into the fault planes. The result data exhibits a high value of magnitude approximately 70mm extension strain rate on the East-West axis. The extensive strain was detected at the triangular network of UMAS, SIMU and TEBE Myrtknet stations. The result was un-expected due to lack of reports and findings regarding tectonic activities on the specified site. The uncertainties data findings are significant for further studies are required in order to understand more upon the uncertainties of the specified results shown on strain rate analysis and current motion on the South-West of Sarawak.

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CHAPTER ONE

INTRODUCTION

1.1 Research Background

The tectonic configuration of crustal plates in Southeast Asia is complex. The North-West Trench (Palawan Trough) is a subduction zone that connects the South China Sea to North-West Borneo. (Hall, 2002). The Baram Delta, which runs between Brunei and Sarawak, is an active fold-and-thrust belt (Asrul MUSTAFAR et al., 2014). Contrary to previous studies, With the respect to South China, the eastern section of Java, the island of Sulawesi, and the northern point of Borneo, Sundaland is shown to move independently. The Red River fault between South China and Vietnam is still active, with a strike-slip motion of around 2 mm each year. Although Sundaland's internal deformation is minimal (less than 7 nanostrain/yr), significant elastic deformation accumulates at its borders with fast-moving neighbouring plates. (Simons, W. J. F., et al., 2007).

Figure 1 shows the Lupar Fault Zone in southwestern Sarawak separates the Silantek Formation to the south from the Rajang Group to the north. To the north of the Lupar Fault Zone, the Lubok Antu Melange consists of tectonic pieces and blocks of sedimentary, volcanic, and intrusive rocks, as well as their metamorphosed counterparts, ranging in size from a few centimetres to a few kilometres, surrounded in a fine-grained matrix (E. Honza et., 2000). The Silantek Formation is conformably overlain by the Plateau Formation, which is composed of solid sandstone and forms a crest of the Klingkang Range at the Sarawak-Kalimantan border.