The kinematic model along the Sumatran fault using a new dense GNSS observation (AGNeSS+) in Banda Aceh

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The 2004 Sumatra-Andaman earthquake (Mw 9.2) has occurred along the Sunda trench. In Banda Aceh district, evaluation of the earthquake generation potential along the Sumatran fault is highly urgent because of a large fault slip rate, the lack of major earthquakes for more than 100 years and recent Coulomb stress increase on the fault due to the 2004 event. After the 2004 event, we have deployed the Aceh GNSS Network for the Sumatran fault System (AGNeSS), which consists of 24 GNSS sites. AGNeSS have releveled the along-strike variations of elastic coupling and creeping along the Sumatran fault system (Ito et al.,2012). Recently, seismic activity is increasing around the Seulimeum fault. So, we try to evaluate the earthquake potential around the Seulimeum fault.

However, AGNeSS have already passed a decade since developed, and the site condition of GNSS sites is disintegrating. So, we extend AGNeSS, which consists of new dense 25 GNSS site (we call the AGNeSS+). We developed the new GNSS site in 2016. The AGNeSS+ aims to evaluate the seismic potential along the Seulimeum fault, where is close to urban of Banda Aceh province. The new dense GNSS site has two profiles crossing the Seulimeum fault. The length and the average interval of the profile are about 30km and about 3km, respectively. Also, an interval of GNSS site near the Seulimeum fault is shorter.

In this study, we show the first result of AGNeSS+, and a block motion model around the Banda Aceh area base on AGNeSS+. We developed the block motion model based on geological information. The Banda Aceh city locates between two fault segments, which is Aceh and Seulimeum segments. The block motion model considers these block boundary. In this presentation, we show the first results of slip deficit along Seulimeum segments and kinematic block motion.

Keywords: GNSS, Banda Aceh, Block motion model