

## Ground Deformation Along the Sumatran Fault in Aceh, Sumatra, detect by AGNeSS GPS Network (Preliminary result)

# Gunawan Endra[1]; Takeo Ito[2]; Agustan Agustan[2]; Fumiaki Kimata[3]; Takao Tabei[4]; Irwan Meilano[5]

[1] Nagoya University; [2] Environmental Studies, Nagoya Univ.; [3] Res. Center Seis. & Volcanology, Graduate school of Environ., Nagoya Univ.; [4] Applied Sci., Kochi Univ.; [5] Earth and Planetary Sci., Nagoya Univ.

The Sumatran Fault System (SFS) which located in the western side of Indonesia, is one of the most complex strike slip fault in the world. With distance over 1900-km, Sumatran fault, which located in the inland of Sumatra, accommodates a significant amount of the strike-slip component of the oblique convergence between the Australian/Indian and Eurasian plates [Sieh et al., 2000].

Sumatran fault slip rate is slightly increasing, from south-east towards north-west direction. In the south-east area, 3.65deg S to 3.25deg S, the slip rate is 11 mm/yr by geological approach. Further to north-west, at the 2deg N to 3.55deg N, the slip rate is 27 mm/yr [Sieh et al., 2000]. By using geodetic approach, slip rates between 2deg S to 3deg N is 23-27 mm/yr [Genrich et al., 2000]. Another method was conducted by using SPOT images to infer slip rate in some areas [Bellier et al., 1995]. Their rates range from 6+-4 mm/yr at 5deg S to 23+-2 mm/yr at 2deg N. However, in Aceh segment (4.4deg N to 5.4deg N), the slip rate is not well understandable.

Our continuous and campaign GPS in Aceh, northern part of Sumatra, has been started since 2005. The last GPS site that we had construct was in 2008. Totally, there are 7 continuous GPS stations and 18 GPS campaigns site have been measured. We named our continuous GPS stations as AGNeSS (Aceh GPS Network for Sumatran Fault System). AGNeSS will not be exist without contributions from Indonesian parties, such as Prof. Hasanuddin Z. Abidin from Institute of Technology Bandung, also Didik Sugiyanto and Irwandi from Syiah Kuala University.

Our results show that there is a difference velocity in this region. About 10 cm/yr velocities was calculated in the northern part and about 5 cm/yr in the southern part. This large velocity were thought to be a post-seismic deformation of 2004 Sumatra-Andaman earthquake. We assume that this post-seismic displacement is a viscoelastic normal mode solution [Pollitz et al., 2006]. In the northern part of networks, our result shows consistency with Sumatran fault trace by Sieh et al., 2000, that 2 fault model are the best model rather than 1 fault model.

It is important to continue the GPS measurement in this region since some GPS site only observed in a few months. Thus, collaboration of Japan and Indonesia for continuing GPS measurements in the next following years should make better understanding about the post-seismic deformation of the 2004 Sumatra earthquake, strain accumulation and faults slip in Aceh region.