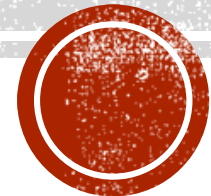




UNITED NATIONS/JAPAN WORKSHOP ON SPACE WEATHER

"Science and Data Products from ISWI Instruments"
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ROLE OF MAGDAS-SUMATRA DATA FOR STUDI EARTHQUAKE PRECURSOR



By

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OUT LINE

- Overview Geomagnetic Monitoring in BMKG
- Motivation Earthquake Precursor in Sumatra
- MagDas-Sumatra Instalation
- Previous research EQ-Precursor with Geomagnetic data
- Geomagnetic monitoring For Earthquake Precursor
 - Schema
 - Research Study: Earthquake Precursor with ULF-EM



Overview Geomagnetic Monitoring in BMKG

GEOMAGNETIC OBSERVATORY MAPS

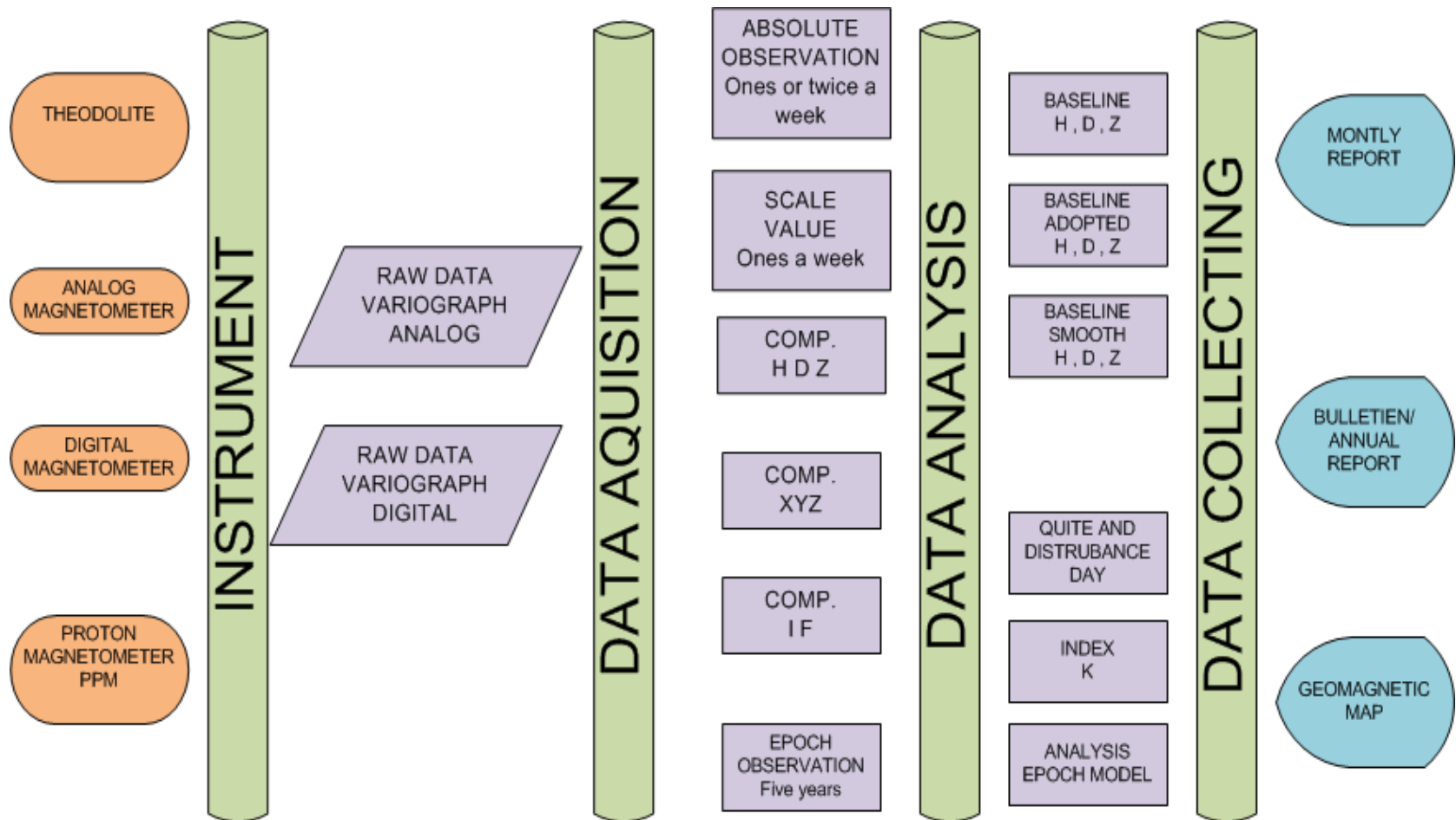


- ▲ BMKG , Geogmanetic Station
- ◆ MagDas (ICSWSE, BMKG,LAPAN)
- ◆ Kototabana (STEL. BMKG . LAPAN)

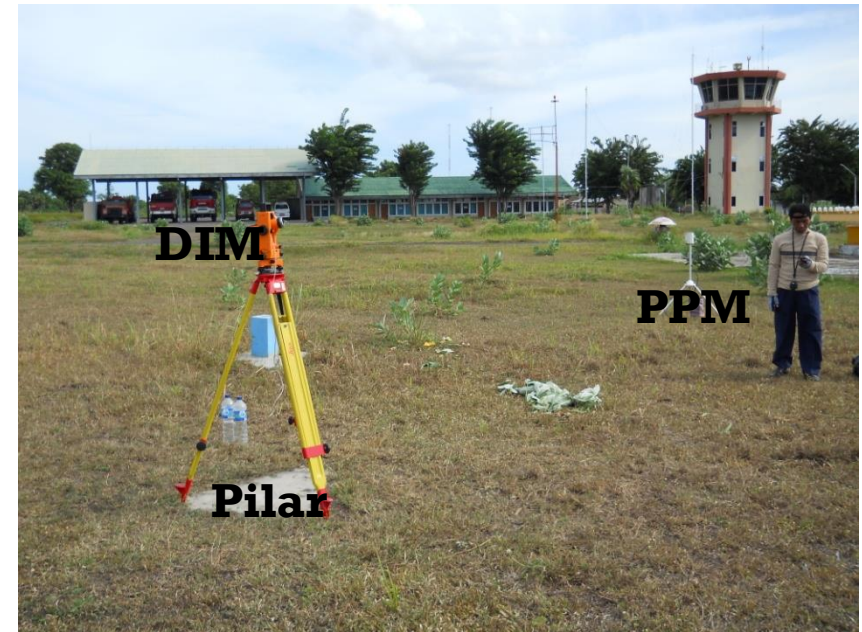
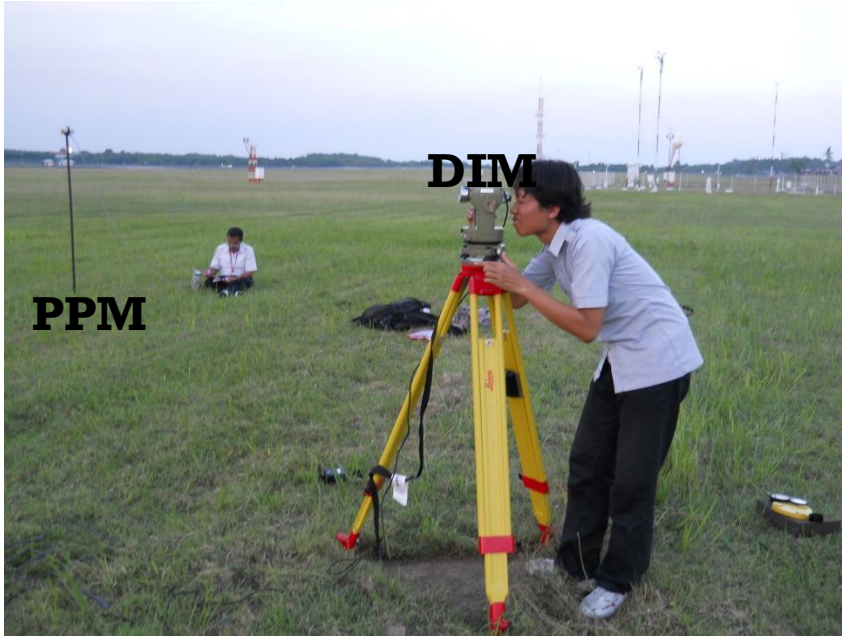


We Have 6 Geomagnetic Observatories are Tuntungan (TUN), Tangerang (TNG), Pelabuhanratu (PEL), Tondano (TON), Kupang (KUP) and Jayapura (JAY) . and Workgoup LAPAN and ICSWSE for MagDas (MND,KGP, JAY) and MagDas-9 Sumatra (SCN,BKL and LWA)

GEOMAGNETIC WORK IN BMKG



EPOCH ACTIVITY

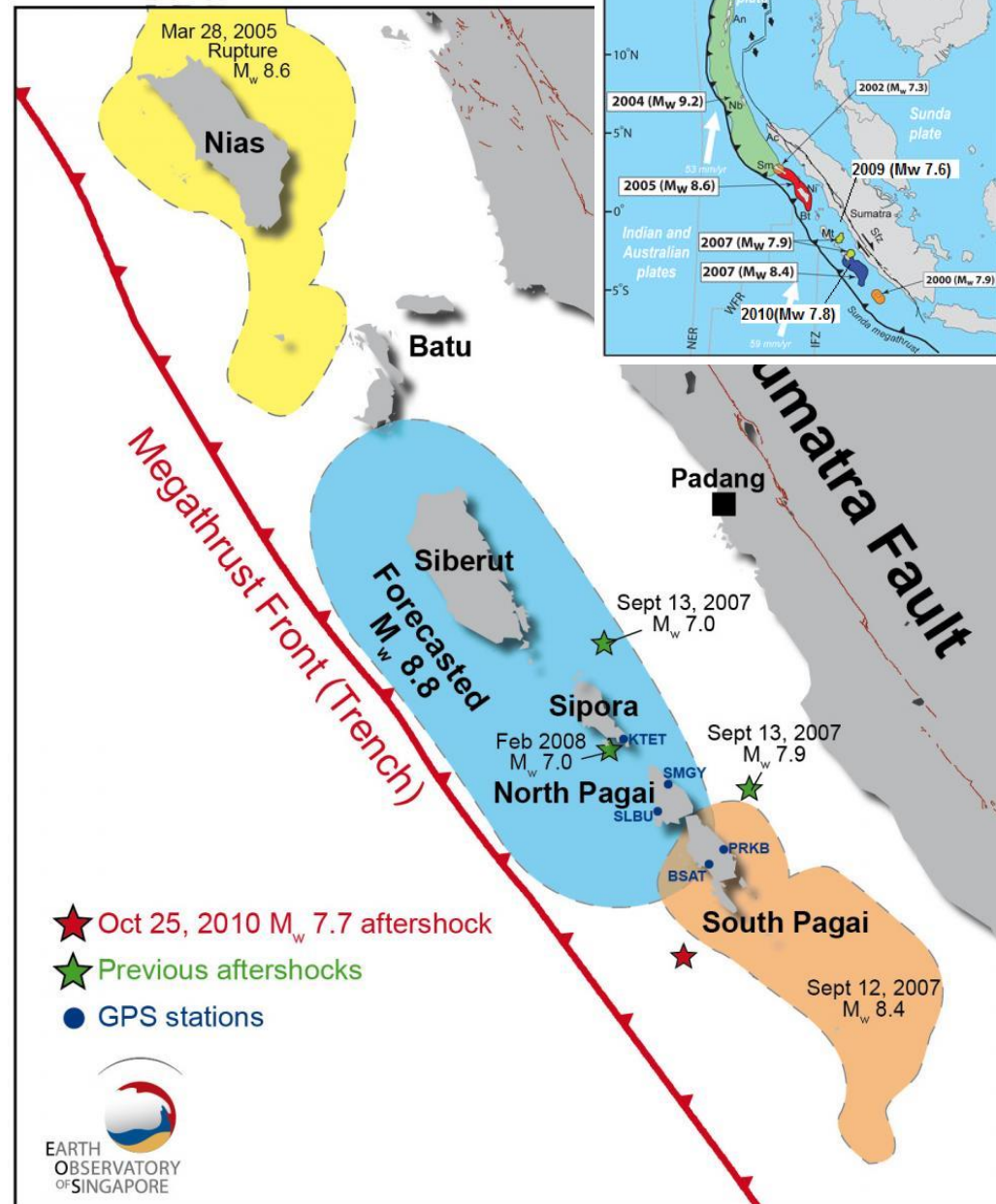


Measurements Declination and Inclination Ngurah Rai airport Denpasar (Epoch 2010) **Measurements for Repeat Station Wai Oti air port Maumere (Epoch 2010)**

Repeat station measurement every 5 year (epoch Magnetic) for correction value Declination, Inclination in the Point (city) and We have 103 site for make geomagnetic Epoch

MOTIVATION

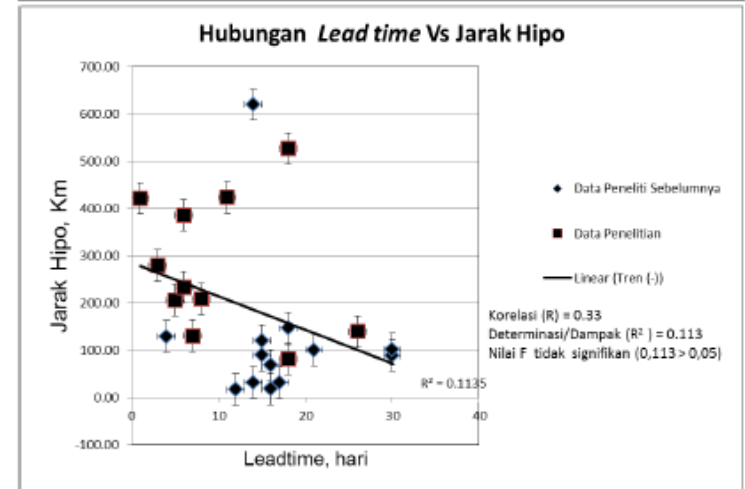
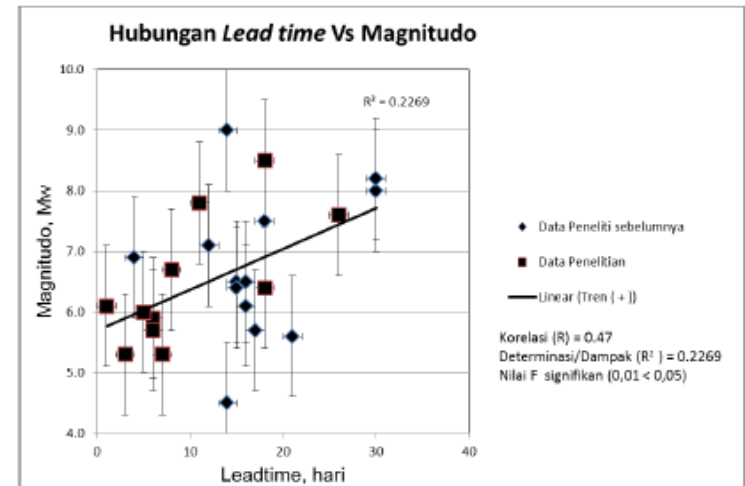
1. Sumatra Have Potential The Big Eq from Mentawai Megathrust
2. MAGDAS- Sumatra is BMKG- ICSWSE Project for Monitoring Earthquake Precursor using Geomagnetic Data
3. MAGDAS – Sumatra Was Install in 3 site in Liwa (LWA, Inland Sumatra), Sicincin (SCN, Inland Sumatra) and Gunungsitoli (GSI, Nias Island).
4. We want to make Parameter determination for Onset time and lead time from anomaly of ULF-Emission about EQ Precursor.
5. This study is a preliminary study for earthquake precursors using the data Magdas-Sumatra.



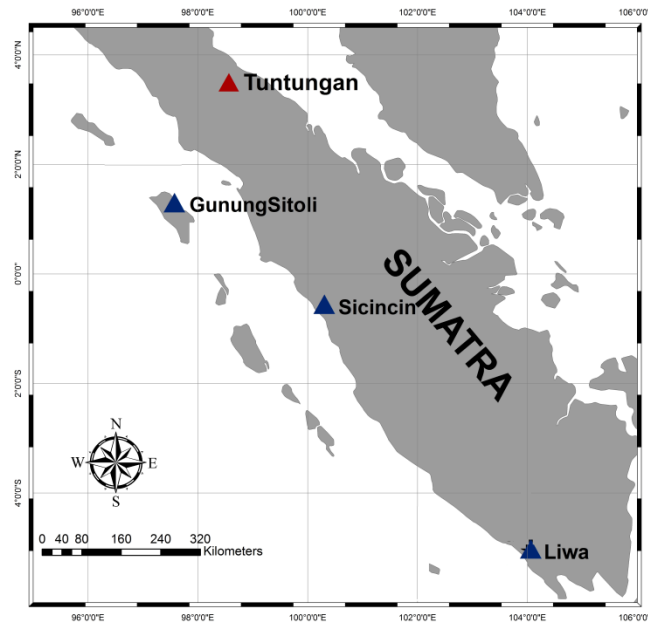
PREVIOUS RESEARCH

EQ-EARTHQUAKE PRECURSOR WITH GEOMAGNETIC DATA

- Saroso et al 2008 determine signature Precursor of Aceh 2004 and Nias 2005
- Ahadi 2014 was make correlation lead time Vs Magnitude using Kototabang Station



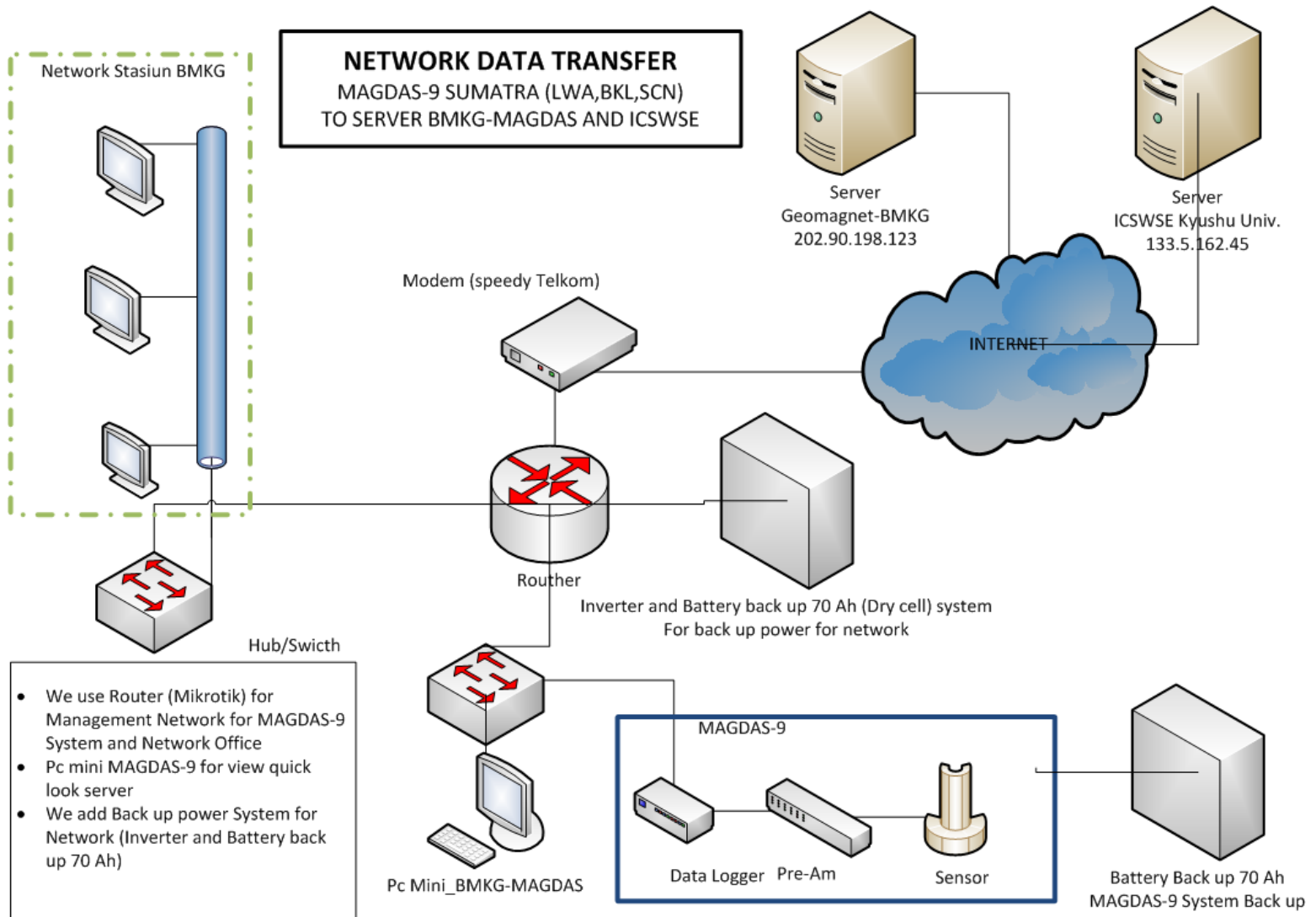
MAGDAS-SUMATRA INSTALATION



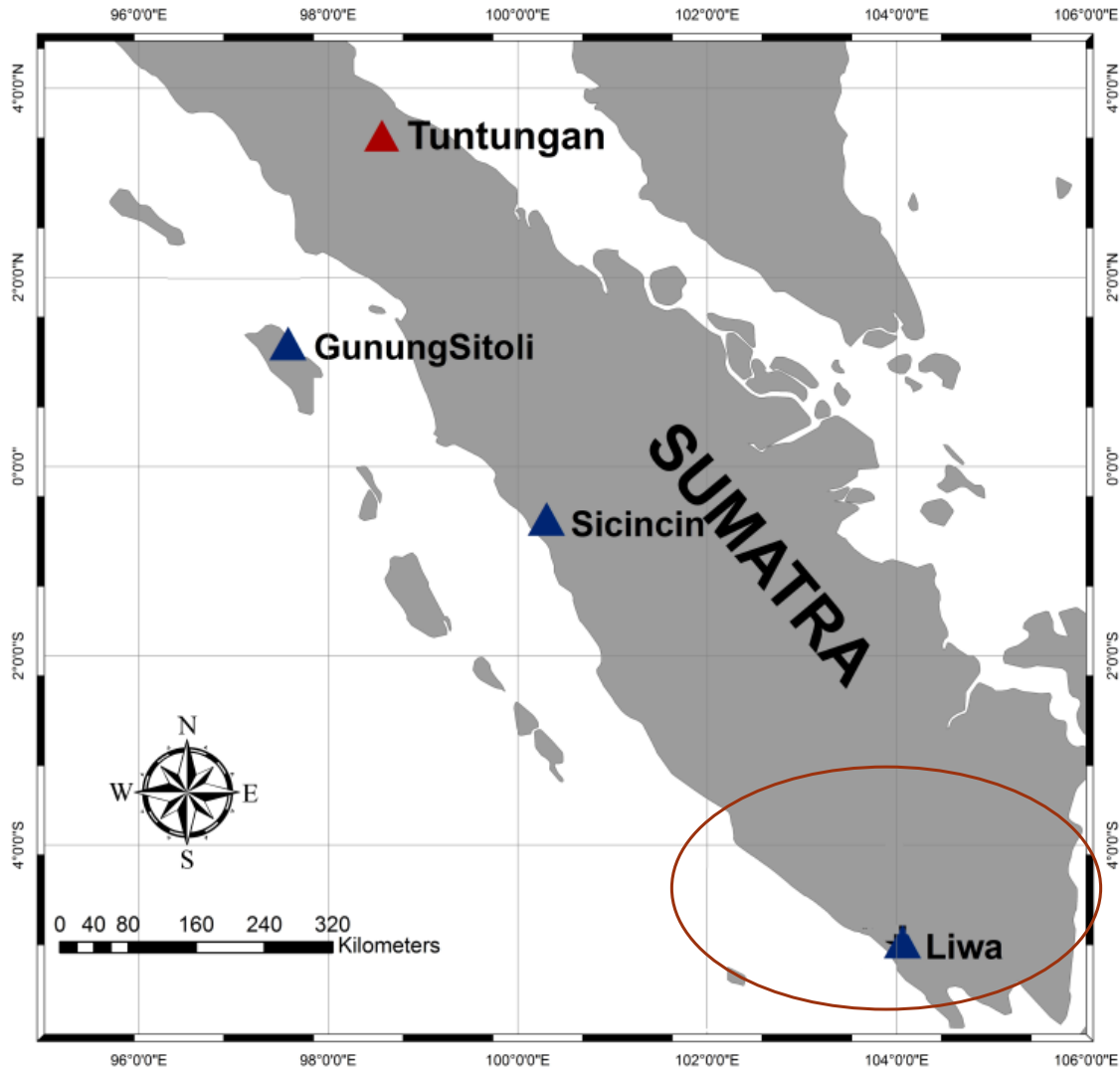
MagDas-9 (Sensor and Data Logger)

MagDas-9 Tilt Setting

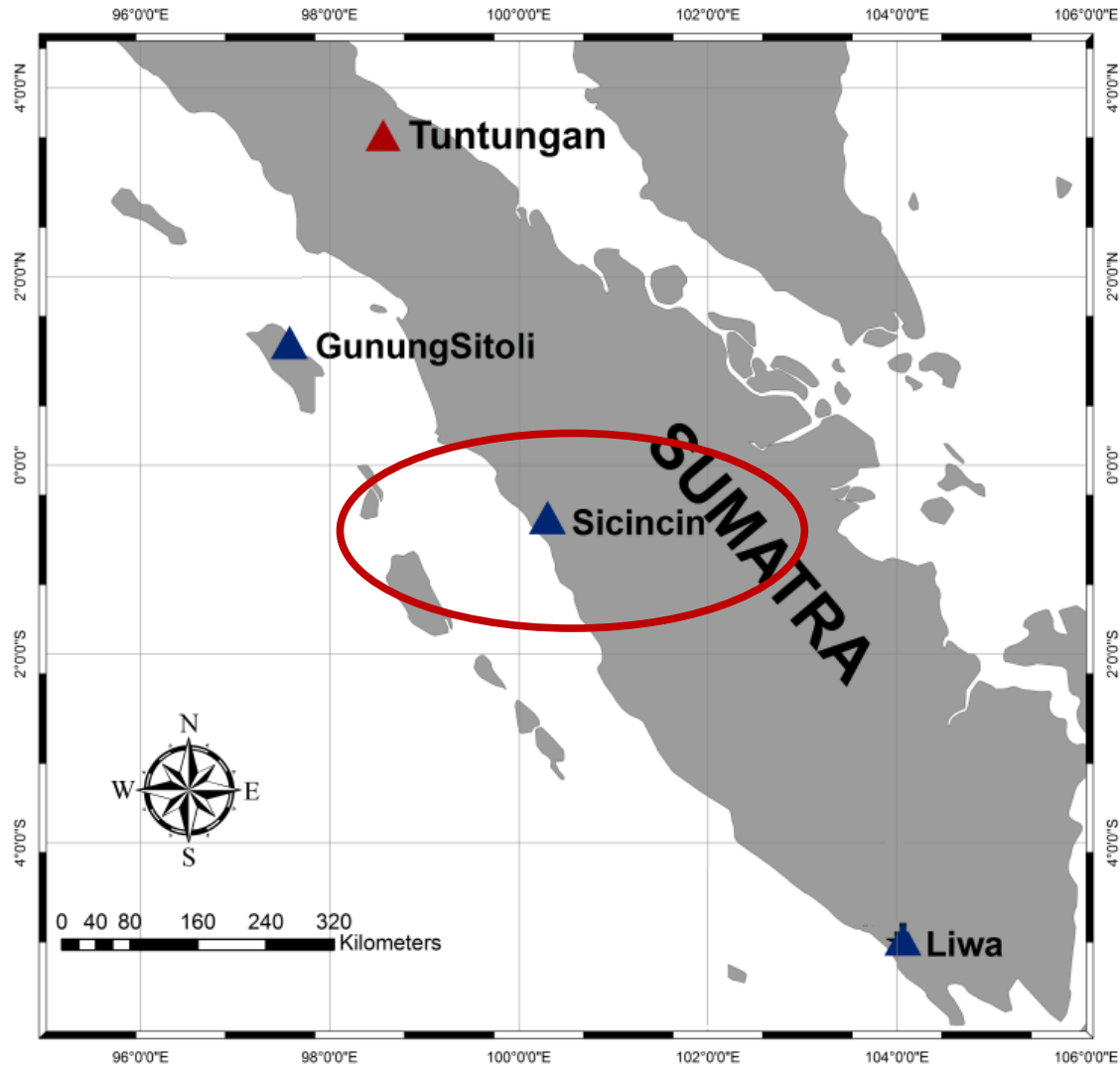
Topology network



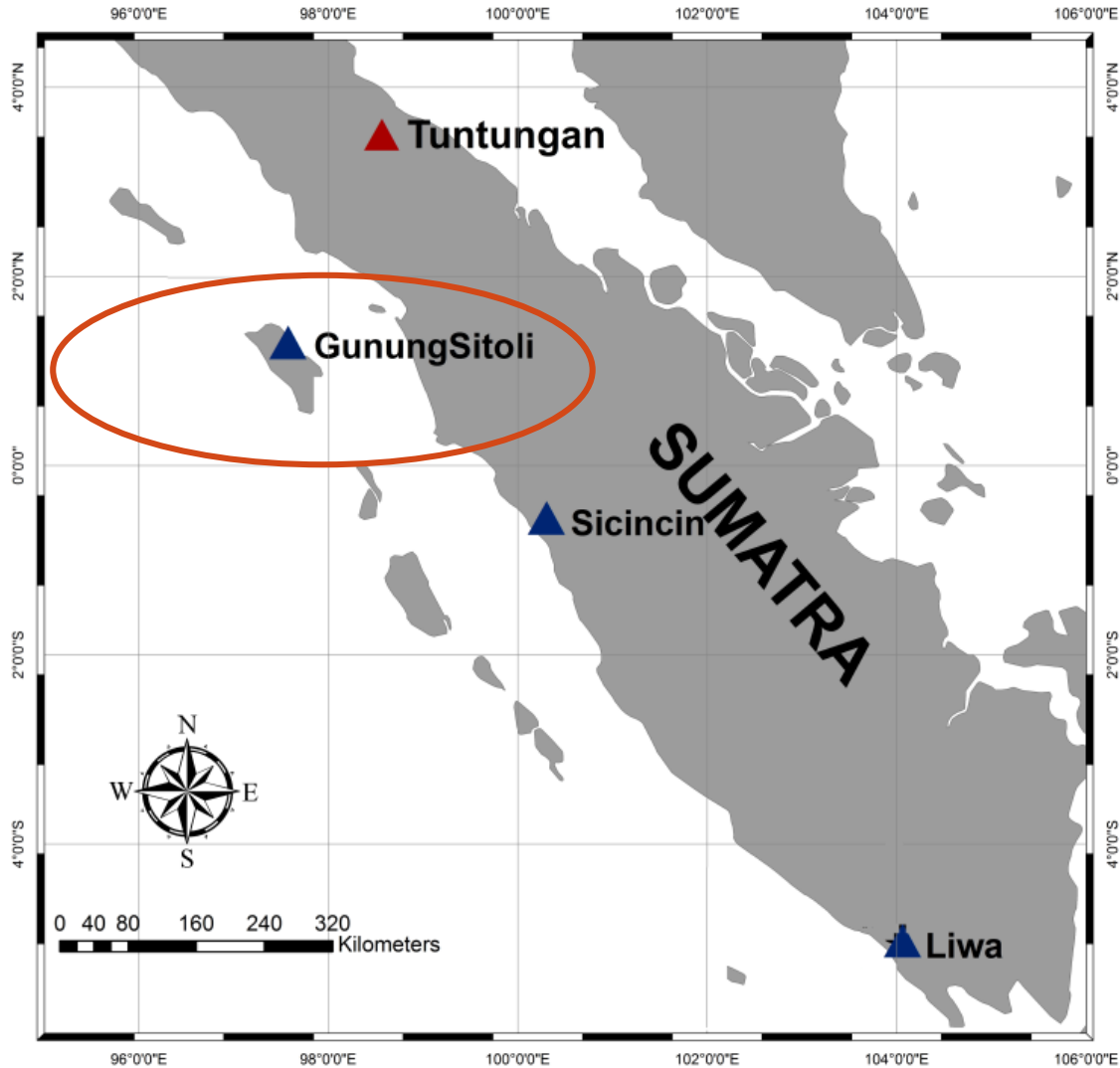
LIWA (LWA-MAGDAS)



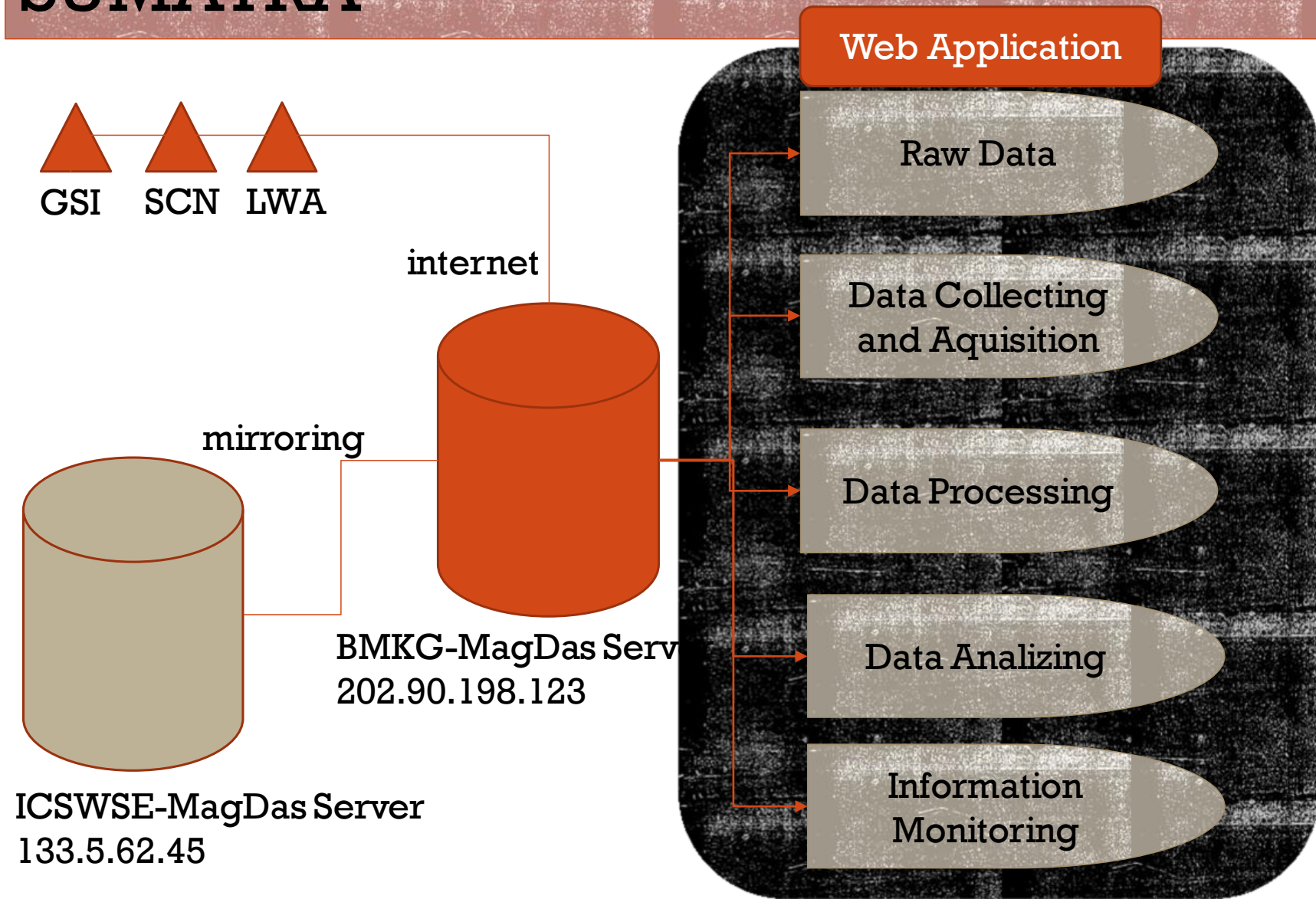
SICINCIN (SCN-MAGDAS)



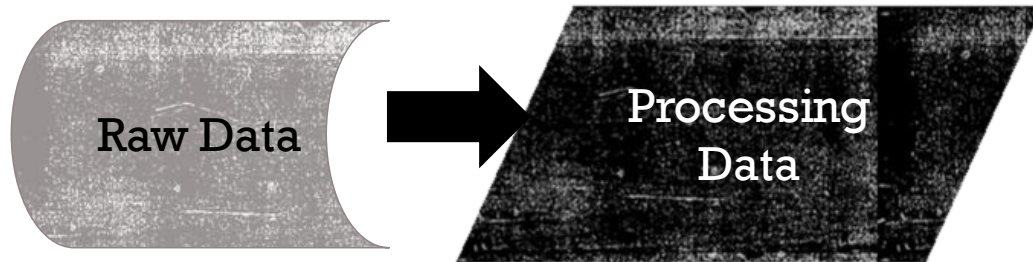
GUNUNGSITOLI (GSI-MAGDAS)



SCHEMA RESEARCH → EARTHQUAKE MONITORING WITH MAGDAS-SUMATRA



SCHEMA PROCESSING DATA



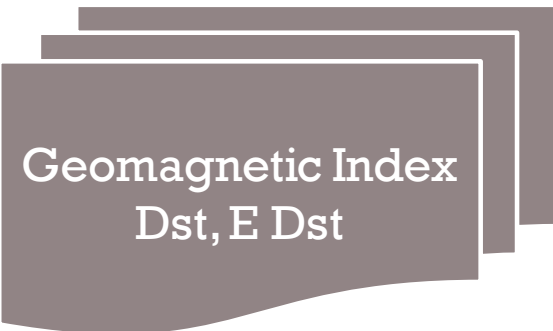
Spectrum
Analysis

Polarization
power ratio
Analysis

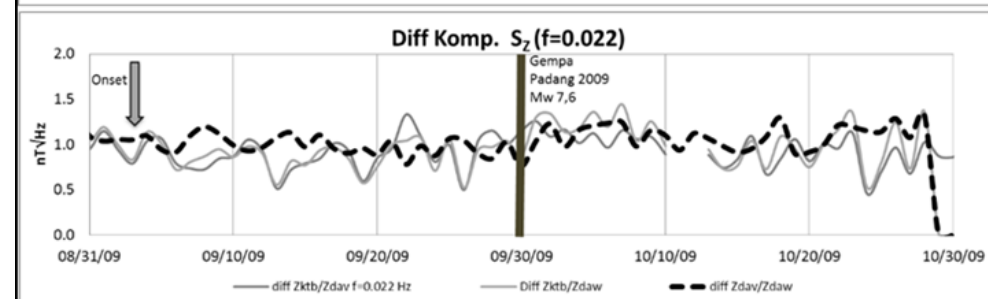
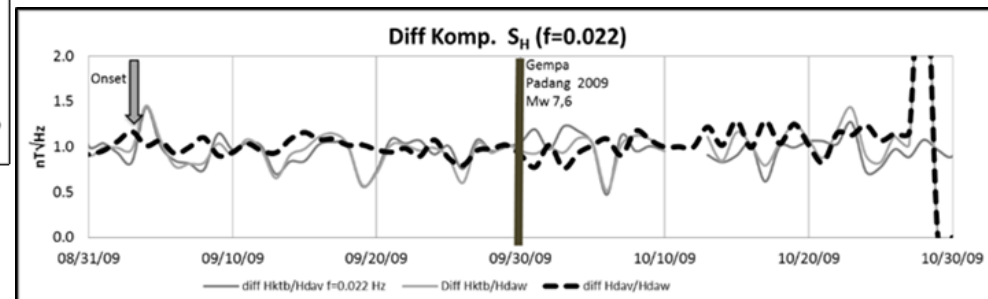
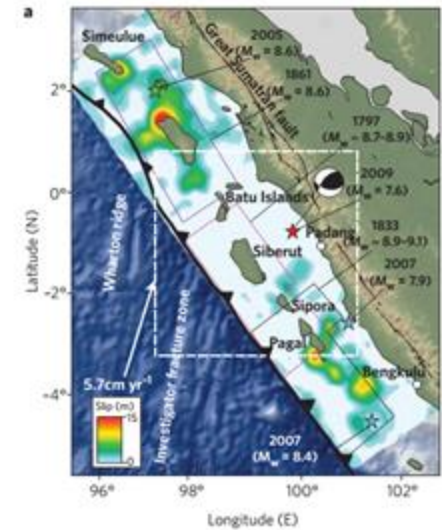
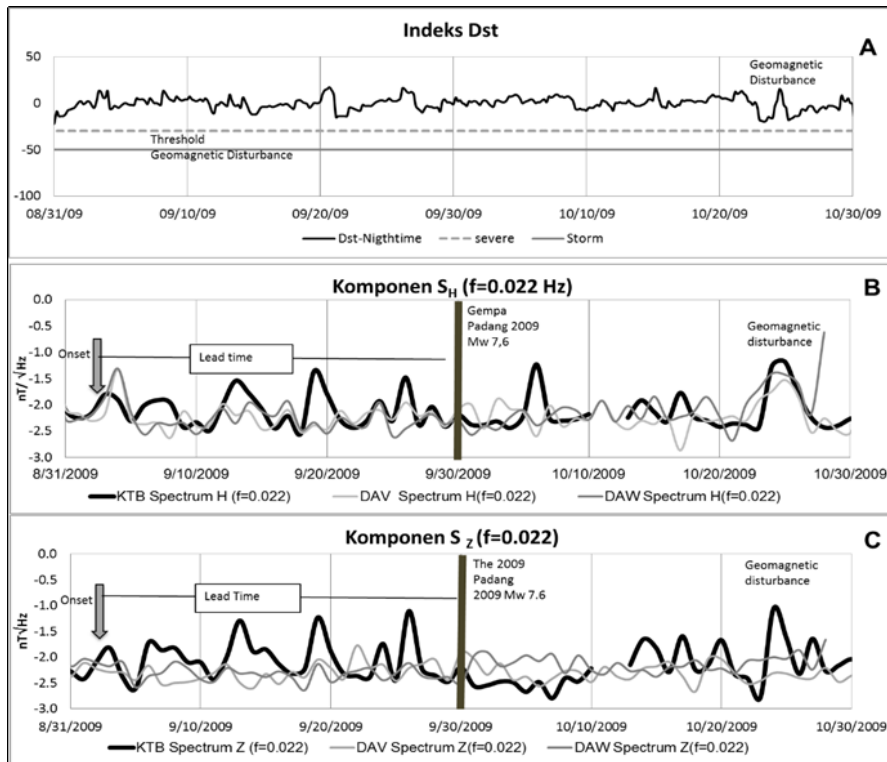
Signature
Precursor Eq

Onset Time

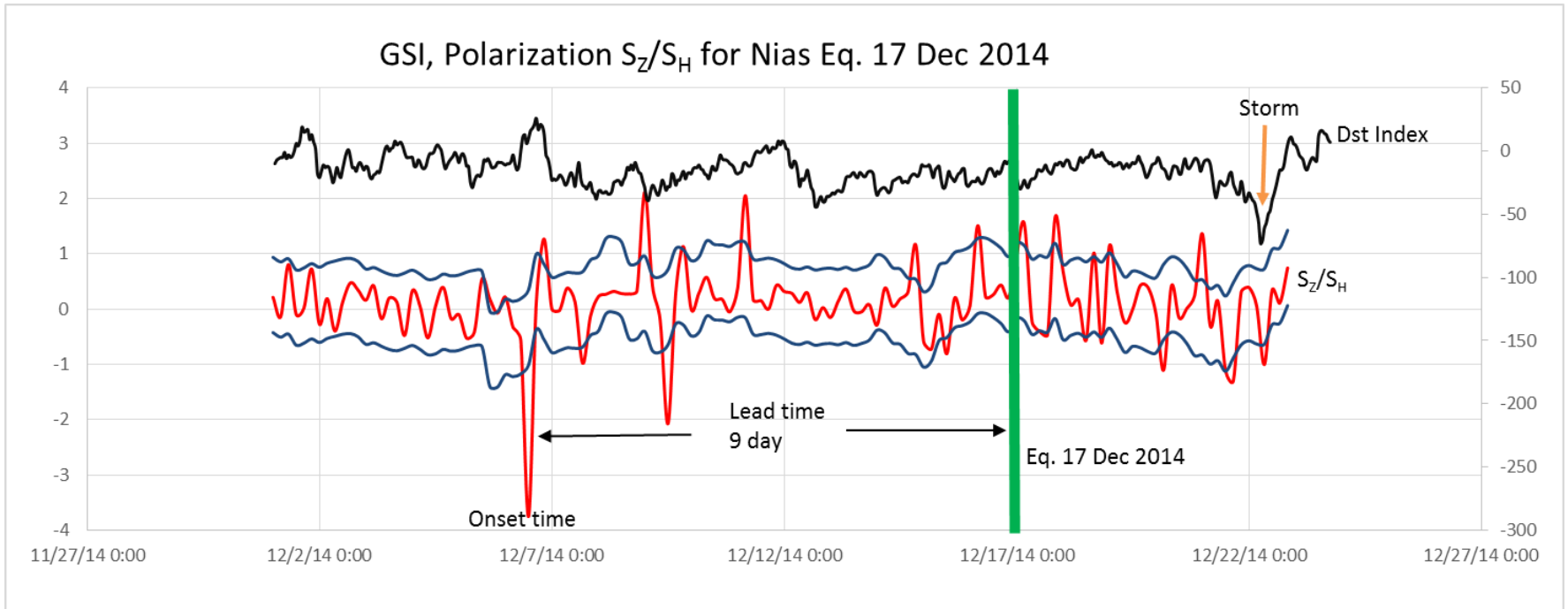
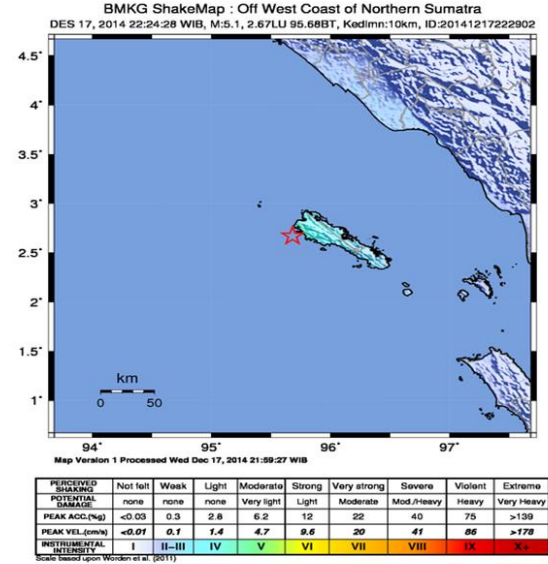
Lead time



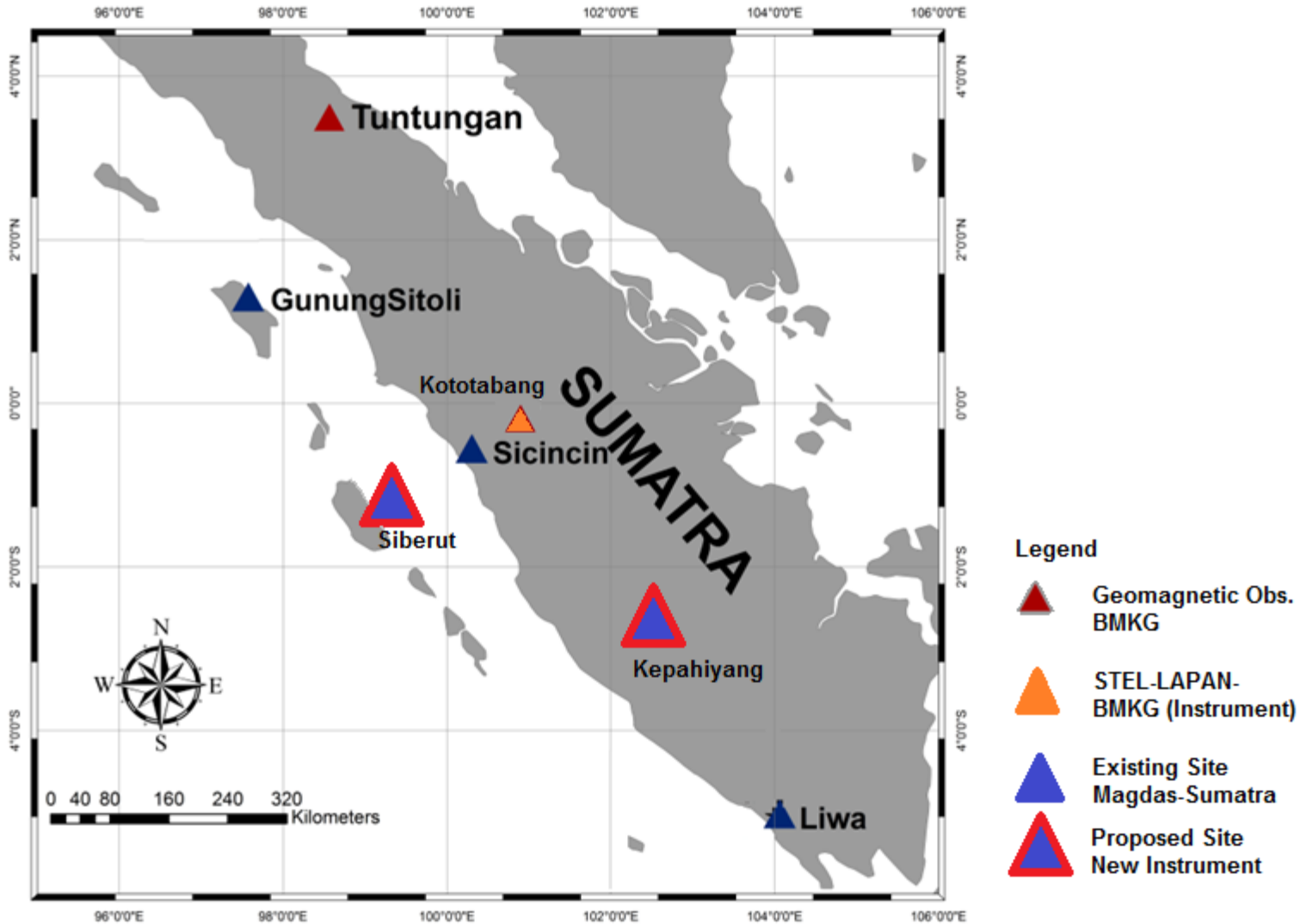
SIGNATURE OF PRECURSOR PADANG EQ M_w 7.6, 2009



RESULT: EQ PRECURSOR WITH MAGDAS-SUMATRA DATA



MAGDAS-SUMATRA NEXT STEP



SUMMARY

- Geomagnetic data is powerfull for studi earthquake precursor
- Tectonic Setting of Sumatra is ideal for Geolabs for Studi of Earthquake precursor with geomagnetic data
- Cluster Geomagnetic station need to Monitoring Earthquake precursor with Geomagnetic data.
- Need to more site Geomagnetic Instruments for support Studi of Monitoring Earthquake Precursor



TERIMA KASIH
THANK YOU



History Geomagnetic Observatory in BMKG

1866 -1883: Magnetograph Photo (Germany)

1883 -1937: Magnetograph Photo Adie's

1937 -1942: Magnetograph Photo Topfer-Schulze's

3-Component in Keeper Island North ward Jakarta

Before INDONESIA

1964-now : Magnetograph Ruska and La Coeur 3-Component Install in Tangerang

1980- Now : La Coeur 3-Component Tuntungan (Medan) tahun 1980

1991-now : Magnetograph Digital Fluxgate (EDA Variometer)

Install at Tangerang,

1998-now : Magnetograph Digital Fluxgate (EDA Variometer)

2001-now : DMI Three Axis Fluxgate Magnetometer

di Tondano di up grade dengan bantuan

Geoscience Australia

2003-now : Digital Fluxgate Magnetograph install at Tuntungan INTERMAGNET

2005- now : **MAGDAS-2 Install in MANADO**

2007-now : DMI Three Axis Fluxgate Magnetometer

at Pelabuhan Ratu Sukabumi

2008-now : LEMI-018 install in Tuntungan

DMI Three Axis Fluxgate Magnetometer at Kupang

2009 – now: **MAGDAS-2 Install in KUPANG**

2012 : **Install LEMI-18 and MAGDAS-9 Install In Jayapura**

2012 : **MAGDAS-9 Sumatra for Sicincin, Bengkulu and Liwa**

