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INTRODUCTION

Monitoring seismicity and appropriately analysing the data are important for both scientific and civil applications. Correct analysis forms the premise for estimating the risks in intercontinental seismicity occasioned by tectonic plate interaction. Two earthquakes occurred in Talaud Islands, Indonesia (Indo-Australian plate) on 12 August, 2010 (Fig 1) and 16 April, 2016 (Fig 2). The IMS stations in Africa (African plate) are of teleseismic distances from the two Indonesian events. The ability of these stations to be deployed for scientific purposes was assessed using the two Indonesian events.

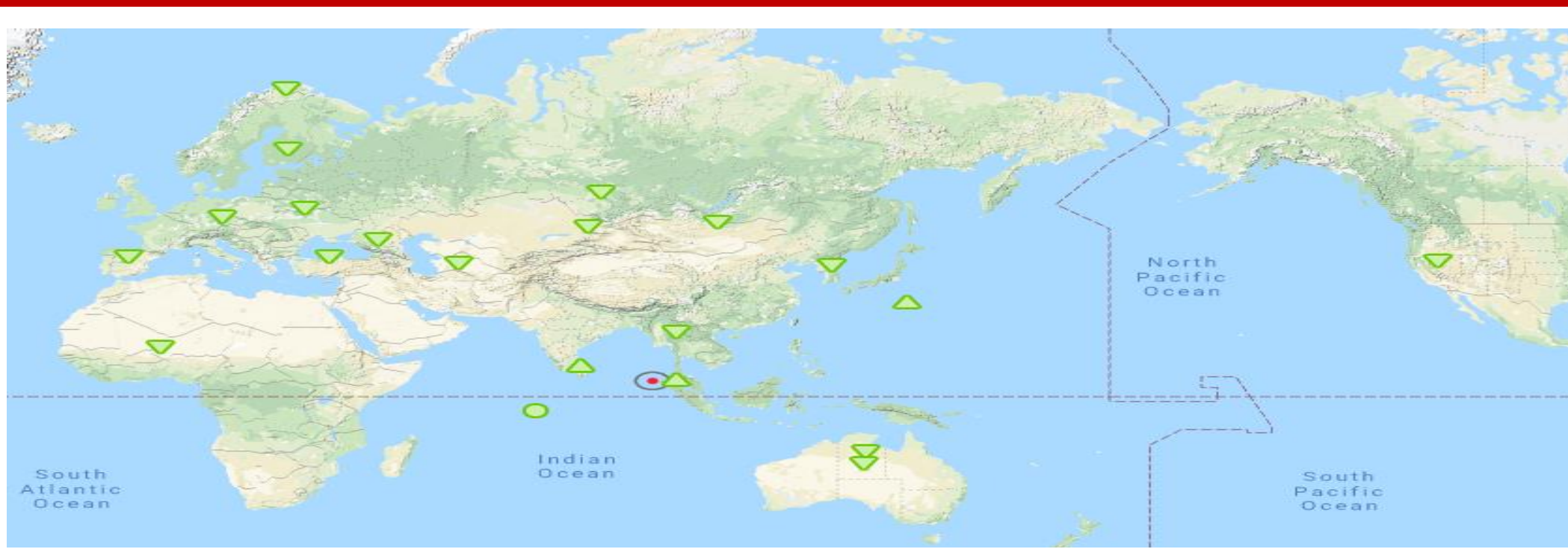


Fig 1: 12 August, 2010 Event

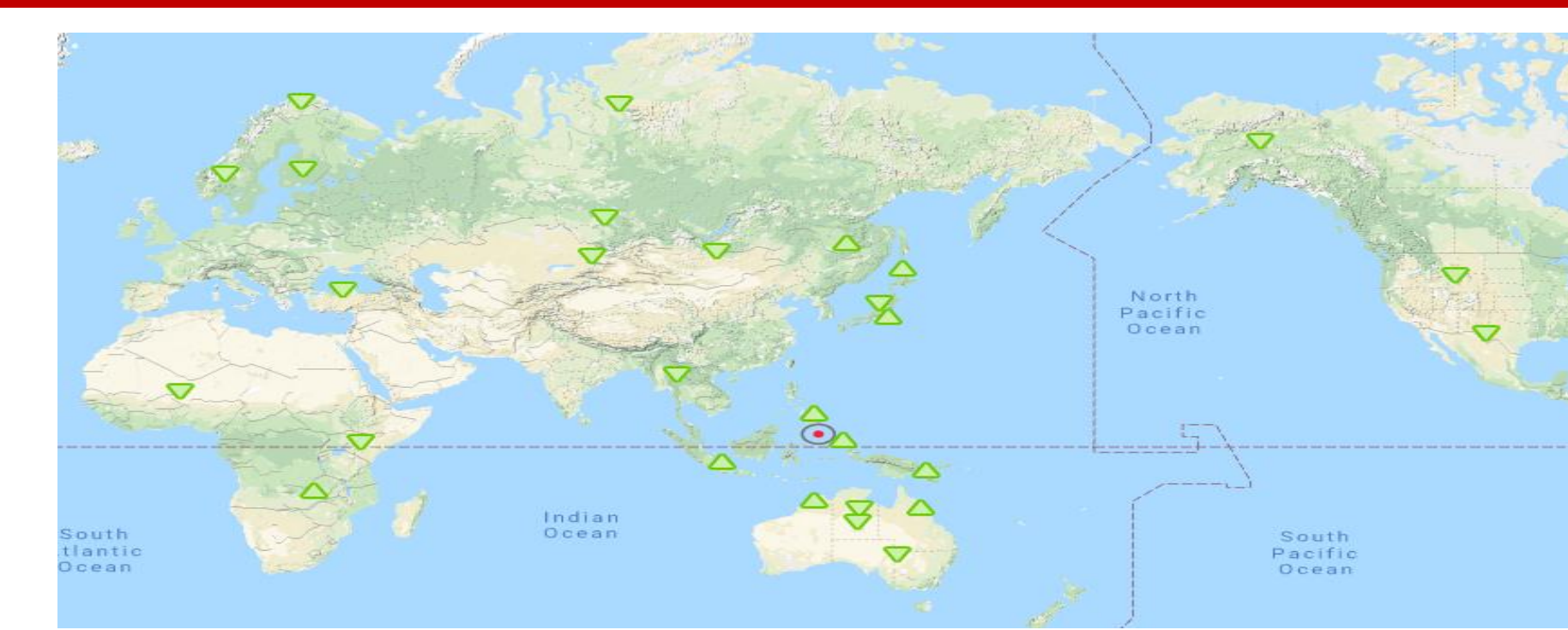


Fig 2: 16 April, 2016 Event

RESULTS AND DISCUSSIONS

The two events appeared small with almost similar magnitude from REB of the IDC

- i) 12 August, 2010: ML 3.9, mb 4.2, mbtmp 4.2, Ms 3.5
- ii) 16 April, 2016: ML 4.2, mb 4.3, mbtmp 4.3, Ms 3.4

TORD station was the common station in both events (Table 1) and was used data analysis. Geotool software was used to study the spectrum and FK to determine the azimuth, arrival time and slowness (Fig 3-8).

Station	Type	Distance	Date	Wave signal clarity
LSZ	Auxiliary	98.98	16:04:2016	Very Good
KMBO	Primary	89.26	16:04:2016	Very Good
TORD	Primary	122.56	16:04:2016	Very Good
TORD	Primary	123.2	12:08:2010	Very Good

Table:1

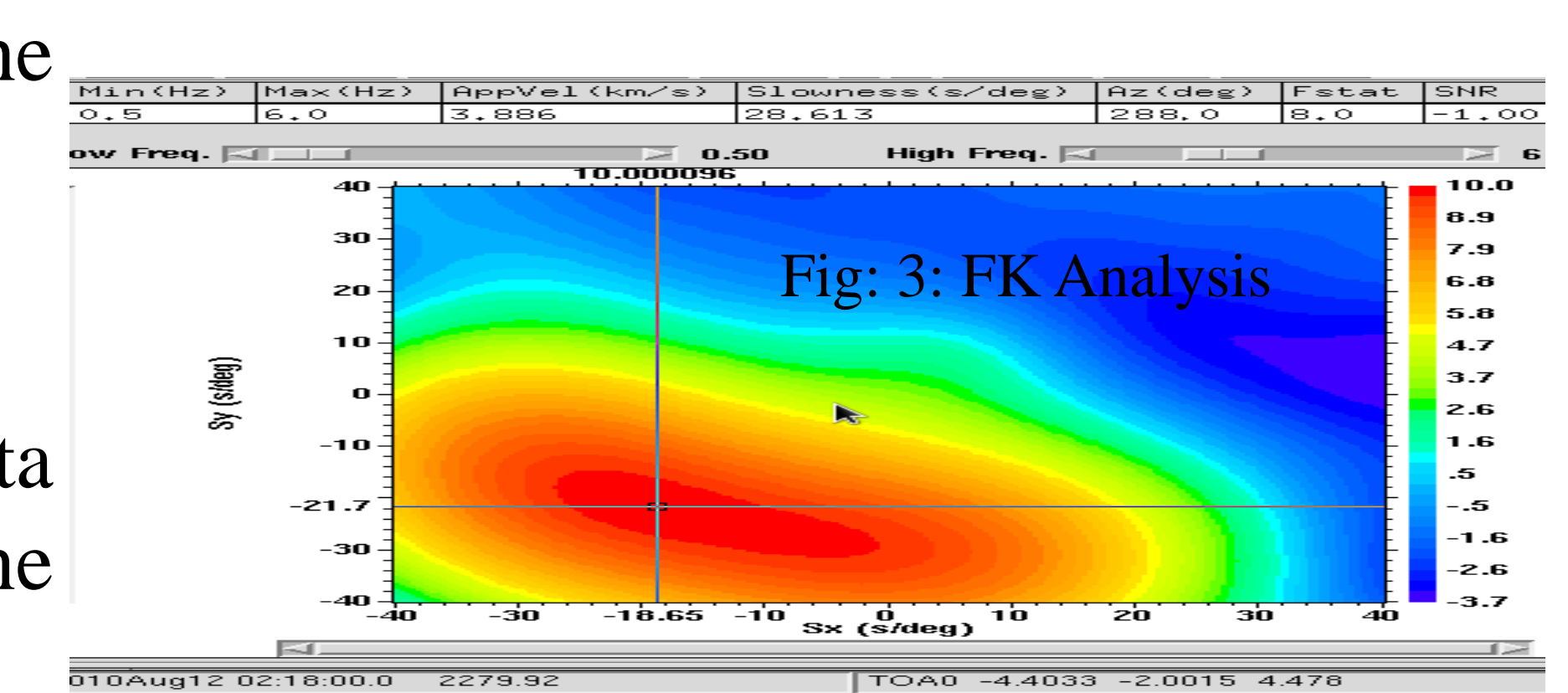


Fig: 3: FK Analysis

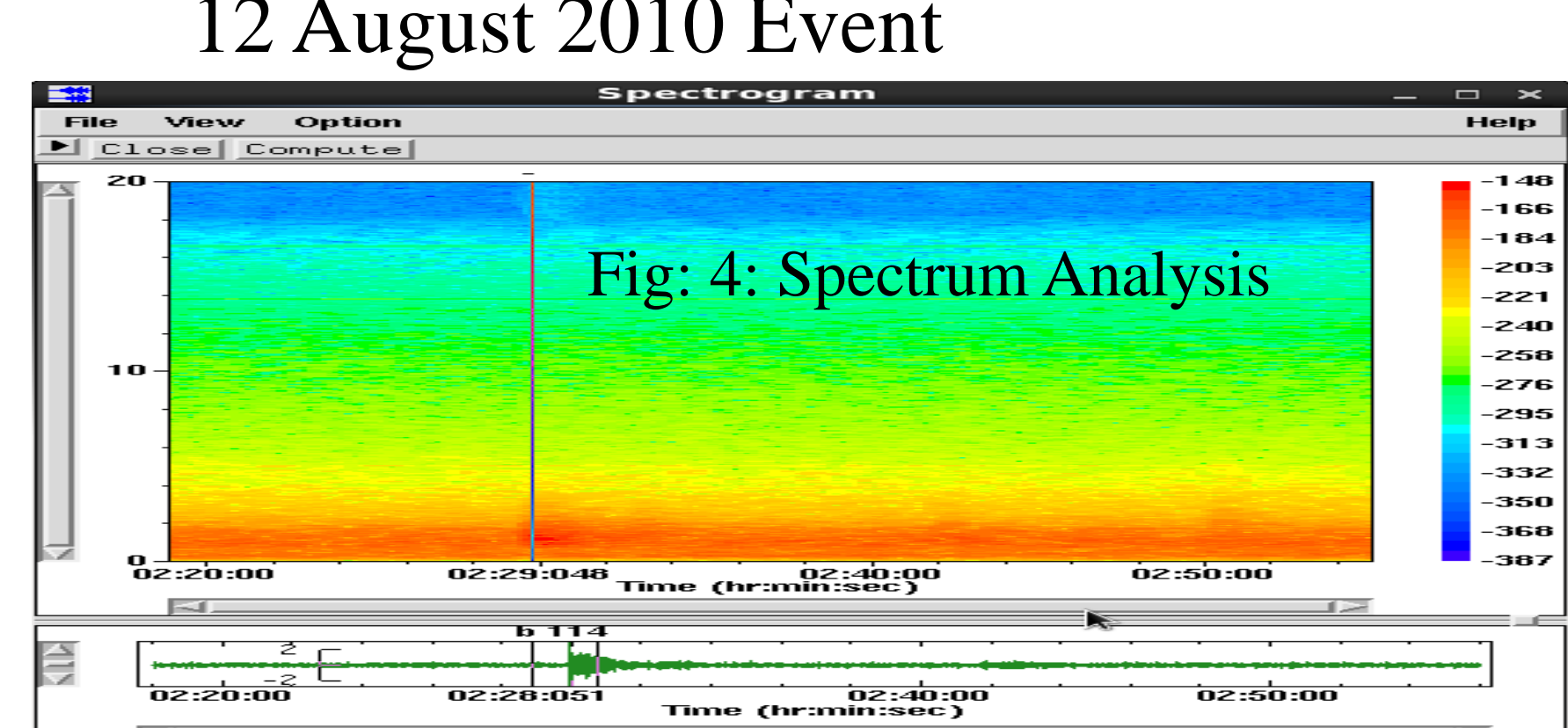


Fig: 4: Spectrum Analysis

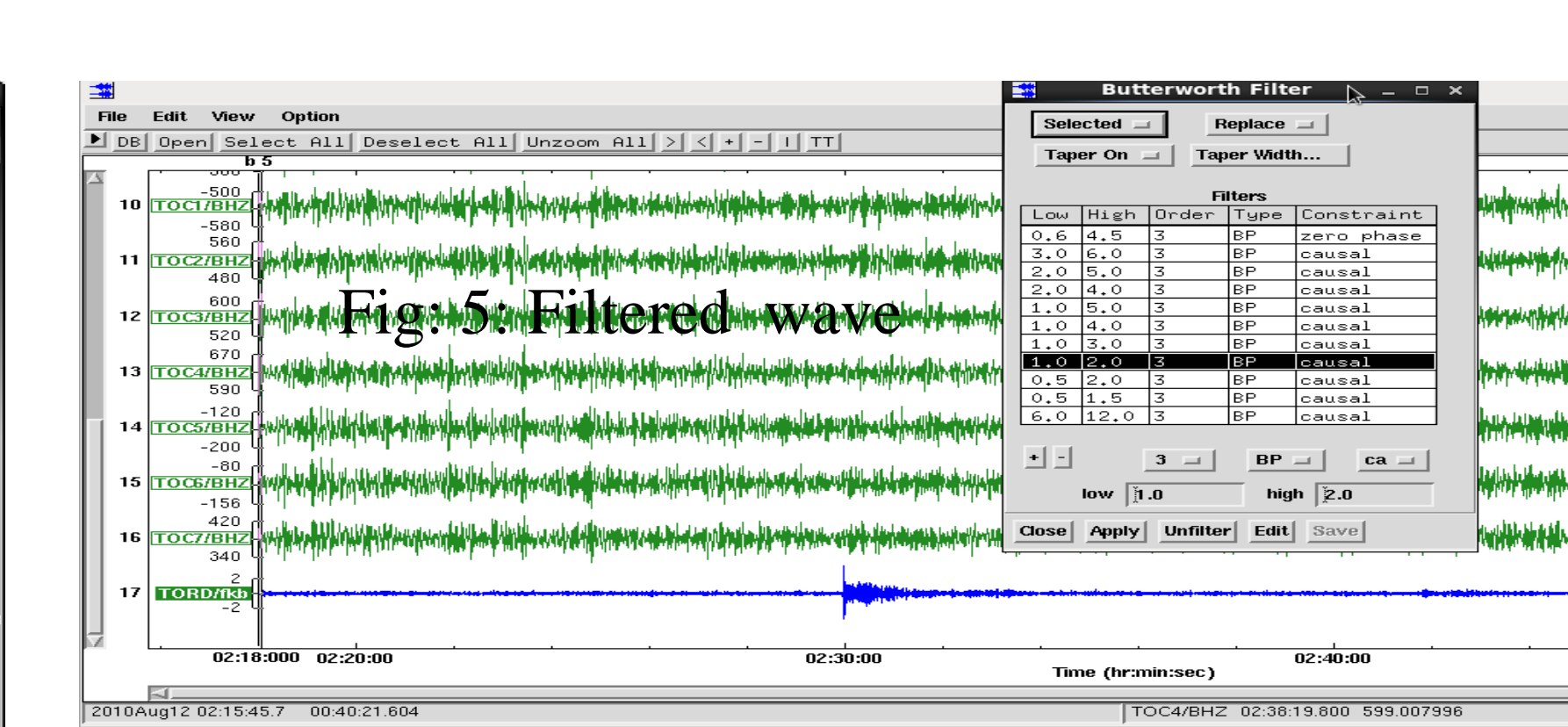


Fig: 5: Filtered wave

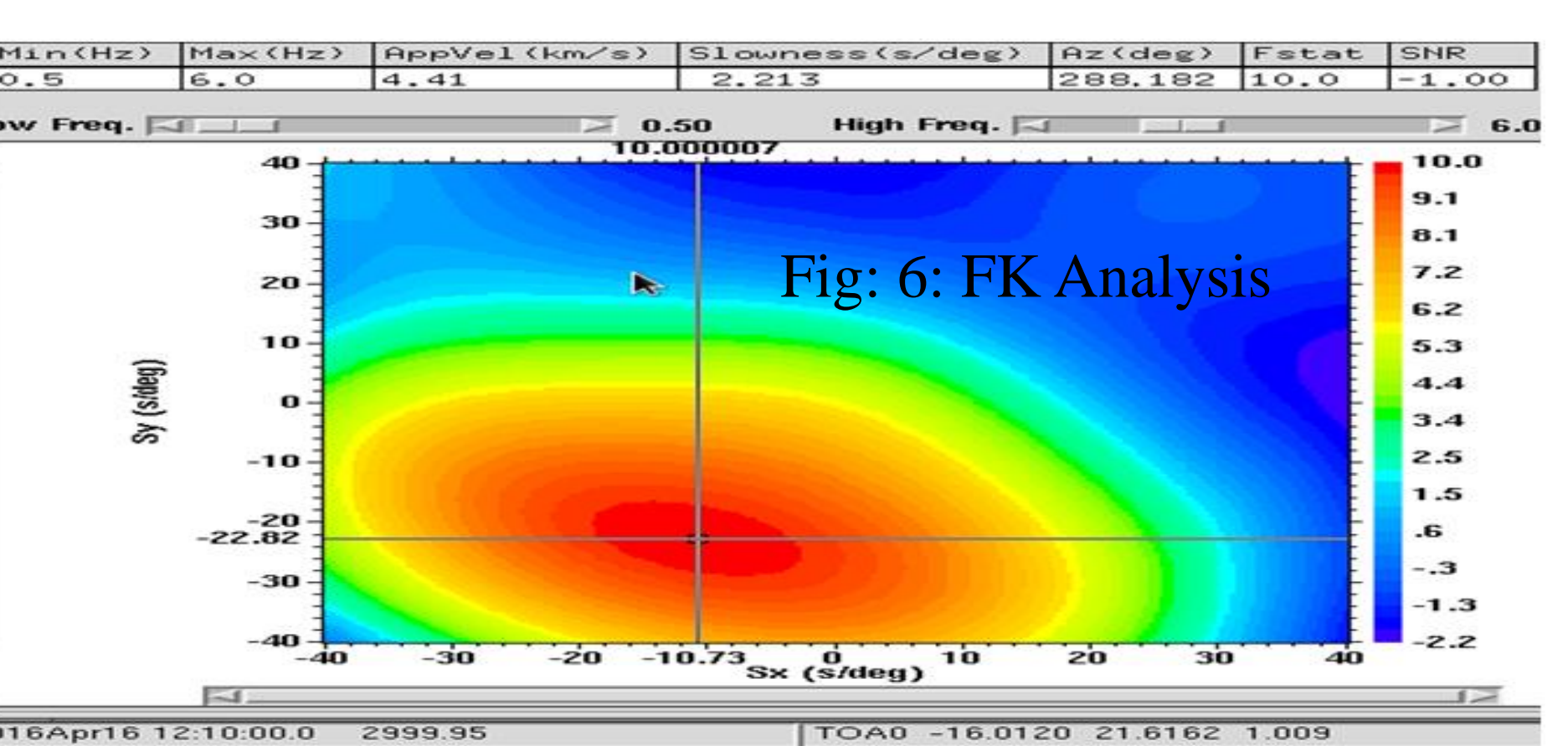


Fig: 6: FK Analysis

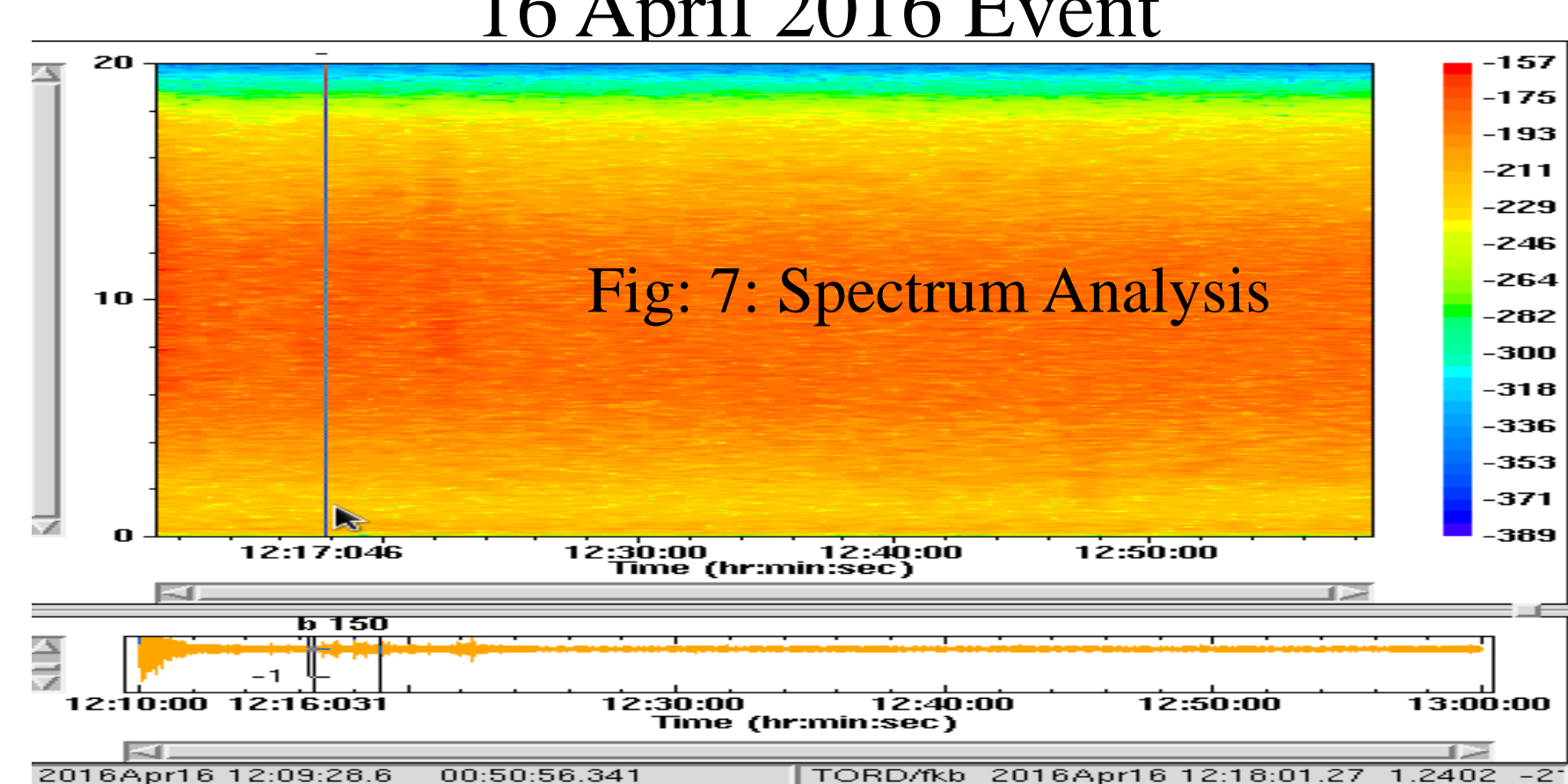


Fig: 7: Spectrum Analysis

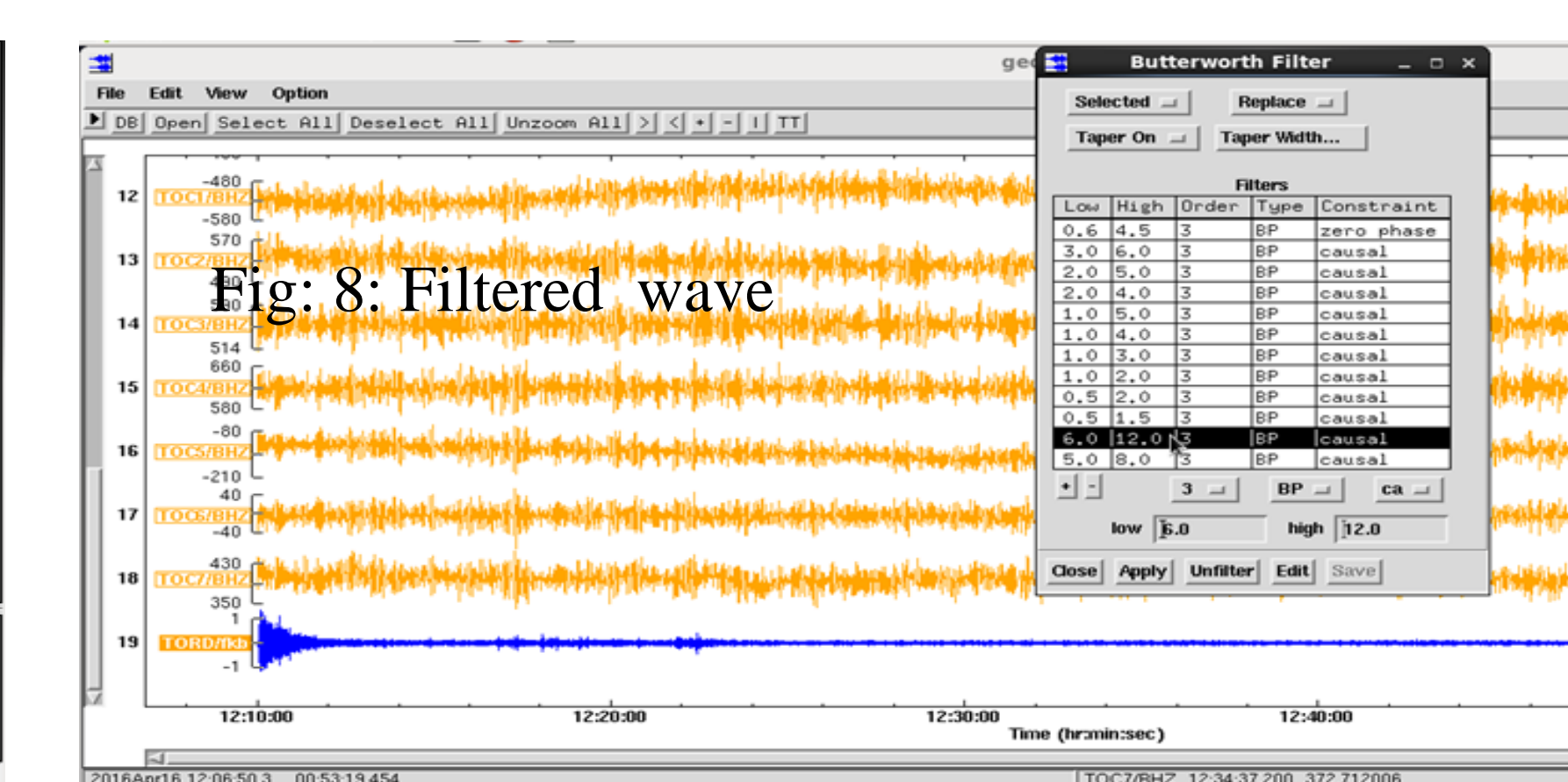


Fig: 8: Filtered wave

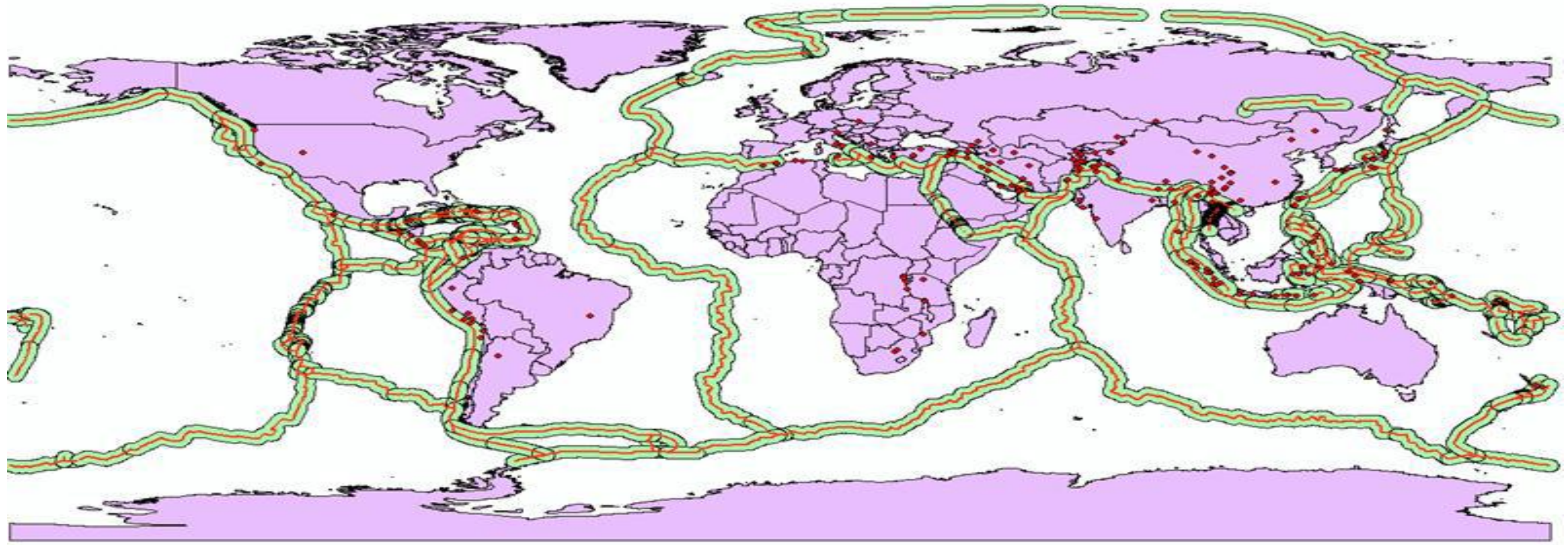


Fig:9: Plate Boundaries (Jogunoorii, 2011)

The Indo-Australian Plate and African Plate are two tectonic plates separated by the Carlsberg Ridge and Central Indian Ridge. The global plates with their boundaries are as seen in Fig 9. The Indo-Australian Plate is considered to be unstable while the African Plate is considered to be stable.

The two Indonesian events under study were of the same magnitude but can be classified as intraplate and interplate earthquakes. The 12 August 2010 earthquake can be classified as an intraplate earthquake while the 16 April 2016 earthquake can be classified as an interplate earthquake. The difference can be seen from the frequencies (Fig 5 and Fig 8) and seismic energy (Fig 4 and Fig 7) of both events.

CONCLUSION

Geotool found in the NDC in-a-box an analytical tool distributed by the CTBTO was used to estimate analyse the azimuth, arrival time and slowness associated with two Indonesian earthquakes. The results obtained in the study indicated one of the events was an intraplate event while the other was an interplate event. The result further indicates that the IMS stations and software supplied by the CTBTO can be used for studying intraplate and interplate earthquakes without jeopardizing the aim of treaty verification.

Reference: Jogunoori, P. (2011). Analysis of Deaths caused by Interplate and Intraplate Earthquakes. MSc. Masters, TAMU, College Station.

Disclaimer: The views expressed on this poster are those of the author and do not necessarily reflect the view of the CTBTO