Earthquake Report: 2018.05.15

M 5.8 Madagascar (& USGS Seismicity 1918-2018 M ≥ 4.5)

Total Intensity Anomaly (nT)
Earth
-200 -150 -100 -50 0 50 100 150 200

Magnitude
8 7 6 5 4 3 2 1

Depth (km)
- ● 0 - 33
- ● 33 - 70
- ● 70 - 150
- ● 150 - 300
- ● 300 - 500
- ● 500 - 800

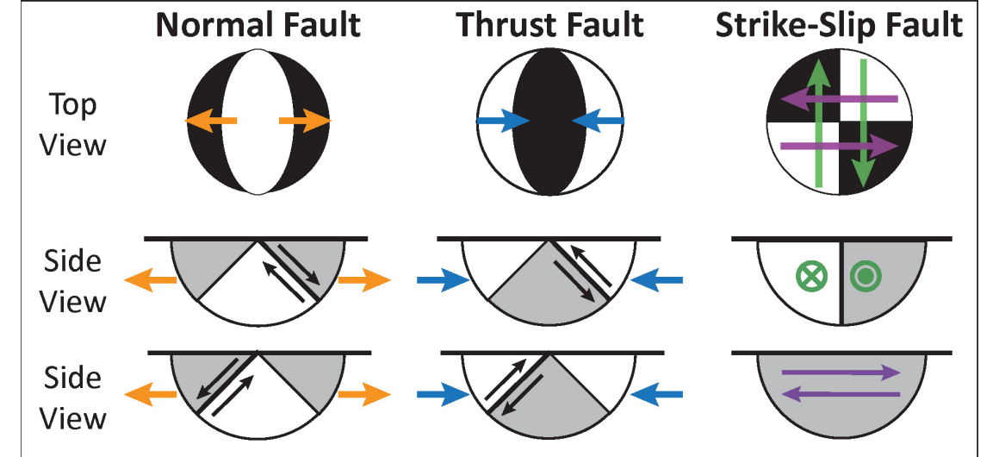
Jason R. Patton
earthjay.com © 2018

USGS Google Earth

Depth to Slab (km)
0 50 100 150 200 250 300 350 400 450 500 550 600 650 700

Plate Boundaries
- Divergent
- Transform
- Convergent
- Other

Plate Motion
*Plate motion vectors rotated based on the direction of plate movement


Normal Fault
Thrust Fault
Strike-Slip Fault
Top View
Side View
Side View

INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+
Shaking	Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
Damage	None	None	None	Very slight	Light	Moderate	Moderate/ heavy	Heavy	Very heavy
Peak Acc	<0.17	0.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
Peak Vel	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16 -31	31-60	60-116	>116

Peak Acc = Peak ground acceleration (g), Peak Vel = Peak ground velocity (cm/s)

West Somali Basin
Tanzania
Mozambique
Mozambique Basin
Madagascar
Davie fracture zone
2015.05.15
M 5.8
P
T
(346, 59, -9)
(80, 82, -149)
II
III
IV
167.20 Ma :: CR12AALE :: Figure 1 :: 2013 June 19
South Sudan Rifts
ETHIOPIA
Marda fault
SOMALIA
Aswa shear zone
Anza rift
Bur Acaba craton
The Seychelles
INDIA
UGANDA
KENYA
Tanzania craton
East African orogenic belt
MADAGASCAR
DSM
Saurashtra
Aravalli belt
Bombay High
Narmada-Son lineament
Kurduwadi lineament
Deccan Trap cover
TANZANIA
RA
MC
Dharwar craton
Cuddapah Basin
Bastar craton
RV
Mad. Rise
Selous Basin
Madurai Granulite terrane
Napier craton
Eastern Ghats mobile belt
MOZAMBIQUE
AT
SRI LANKA
Rayner complex
Gunnerus Ridge
Lurio belt
ANTARCTICA
Areas of outcropping Precambrian rocks
500 km
Beira High
AFRICA
eastern branch
western branch
offshore branch
West Somali Basin
Mozambique Basin
Madagascar
10°N
10°S
20°S
30°E
40°E
50°E
40°0'0"E
10°0'0"S
20°0'0"S
onshore Rovuma Basin
A
Davie Ridge
COMOROS
St. Lazare
Neo-proterozoic nappe
B
C
Unango Mesoproterozoic granulite
Paisley
Lurio Belt
Fig.4
DSDP 242
D
Davie Ridge
Nampula Mesoproterozoic granulite
MOZAMBIQUE
E
MADAGASCAR
Earthquakes
Magnitude
4 - 5
5 - 6
6 - 7
Harvard CMT Focal mechanisms
2D MCS
0 30 60 90 120 150 Kilometer
Projection UTM (37S)
Datum WGS 84
N
E
S
W
Red Sea
Gulf of Aden
Ethiopian Rift
East African Rift
Eastern Branch
Western Branch
?
40°E
50°E
0°
10°S
20°S
Present
182 Ma
170 Ma
150.5 Ma
136 Ma
125 Ma
Sediment thickness (km)
10
8
6
4
2
0
a
b
c
d
e
f
M4n
M10Nr
M15n
M18n
M21n
35°E
45°E
5°N
-5°S
-10°S
-15°S
-20°S
-25°S
Rifted Margin
Oblique Margin
Transform Margin
DFZ
DHOW
VLCC
ARS
0 200 400 km
Figure a
Positive magnetic anomaly
Gravity gradient
Davie Fracture Zone
Figures b and c
Transform margin
Sedimentary basin
Basement high
Fracture zone trend
MOR segment
Continental tie lines
-5000 -4000 -3000 -2000 -1000 0 1000 2000 3000 4000 5000
Elevation (m)
-155 -38 -26 -17 -9 0 6 14 26 45 541
Free-air gravity (mGal)

Reeves, 2014

Franke et al., 2015

Wood and Guth

Phethean et al., 2017