Dynamics of dyke intrusion in the northern rift zone of Iceland

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Further details of the data in this presentation are in


with


Upptyppingar earthquakes
(July-Aug 2007)
red – reverse faults
blue – normal faults

Looking along dyke strike

rms fit to plane: 114m
Location, Location ...
Cambridge relative locations looking along strike: rms 114m
Moment tensor solutions
Reverse Fault

Moment tensor

Double couple

Vertical component 20:52 6 July 2007
Decomposition of moment tensors

Moment tensor \( = \) Isotropic + Deviatoric

- explosion or implosion
- double couple
- compensated linear vector dipole (CLVD)
- zero net force
- zero net moment
- zero volume change
Which of the nodal planes is the fault plane?
Nodal planes: thrust faults
6-25 July 2007: normal faults

Mean fault plane strike/dip = 075/56

Hypocentre strike/dip = 074/50
Mean fault plane strike/dip = 071/51

Hypocentre strike/dip = 074/50

6-25 July 2007: normal + reverse

n = 290
Reverse fault
Magnitude 1 earthquake caused by:

~ mms movement; ~ 10s metres length

OR

~ 10s mms movement; ~ metres length
from Kavanagh & Sparks: Insights of dyke emplacement mechanics from detailed 3-D dyke thickness datasets, J Geol. Soc.
Thank you for listening