

Supplementary Materials for

**Structural controls on the location of Longqi hydrothermal activity
at inside corner revealed by the stress state**

Table 1. Material properties used in the numerical simulation.

Constant	Symbol	Values	Units	
Layer A	Young's modulus	E_A	77 ^{a,c,e}	GPa
	Poisson's	ν_B	0.295 ^{a,c,e}	
	density	ρ_A	2850 ^{a,c,e}	kg/m ³
	thickness	t_B	0.5 ^{a,c,e}	km
Layer B	Young's modulus	E_B	104 ^{a,c,e}	GPa
	Poisson's	ν_B	0.31 ^{a,c,e}	
	density	ρ_B	2900	kg/m ³
	thickness	t_B	2-4 ^{a,c,e}	km
Seawater density		ρ_w	1000	kg/m ³
Gravity acceleration		g	9.81	ms ⁻²
spreading rate at Longqi segment		u_L	14 ^d	mm/y
spreading rate at TAG segment		u_T	50 ^{e,d}	mm/y
Hydrostatic pressure		P	$\rho_w gh$	Pa

^aHyndman and Drury 1976; ^bTao et al. 2013; ^cZhao et al. 2013; ^dCannat et al. 2019; ^eZhao et al. 2012

Table 2. Orientation of maximum horizontal stress inferred from focal mechanism (θ , FM) and numerical model (θ , numerical), respectively.

	θ , numerical	θ , FM	difference	depth (km), FM
A	5°	3°	2°	15
B	-4°	-10°	6°	12
C	-5°	-15°	10°	14
D	-3°	-8°	5°	12.4
E	-1°	5°	6°	12

Table 3. Focal mechanisms used in this study.

Longitude (°)	Latitude (°)	depth (km)	strike (°)	dip (°)	rake (°)	mag
49.74	-37.75	15	93	43	-75	5.3
49.43	-37.77	12	80	43	-101	5.2
49.45	-37.79	14	75	46	-110	4.9
49.81	-37.63	12.4	82	33	-88	5.0
49.86	-37.67	12	95	39	-85	5.9

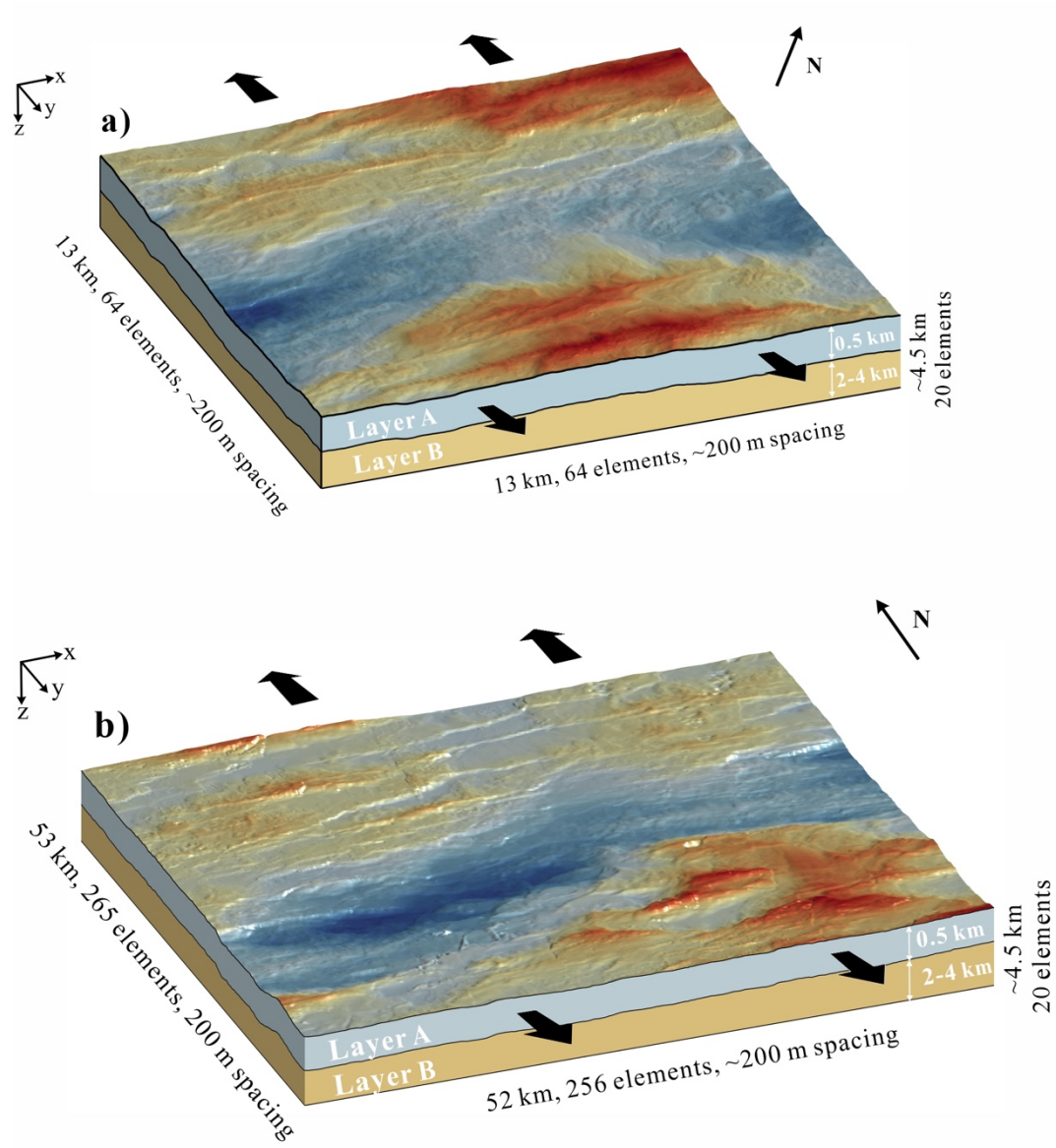


Fig. 1 Initial model setup and boundary conditions for the geomechanical numerical model developed in this study. Our model comprises two layers according to seismic observations and laboratory measurements. The material properties of these two layers are shown in Table 1. The top surface is the seafloor bathymetry, on which hydrostatic pressure is applied. Half-spreading rate are applied on the edges.