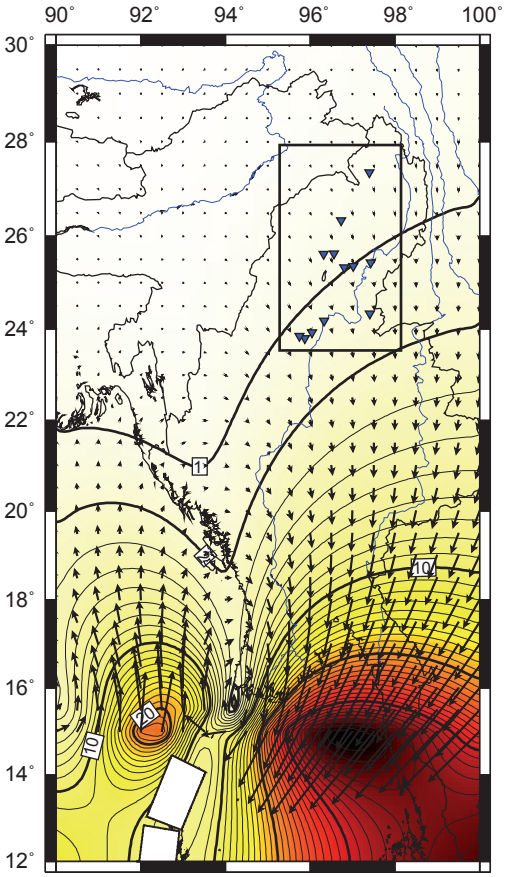
(a)



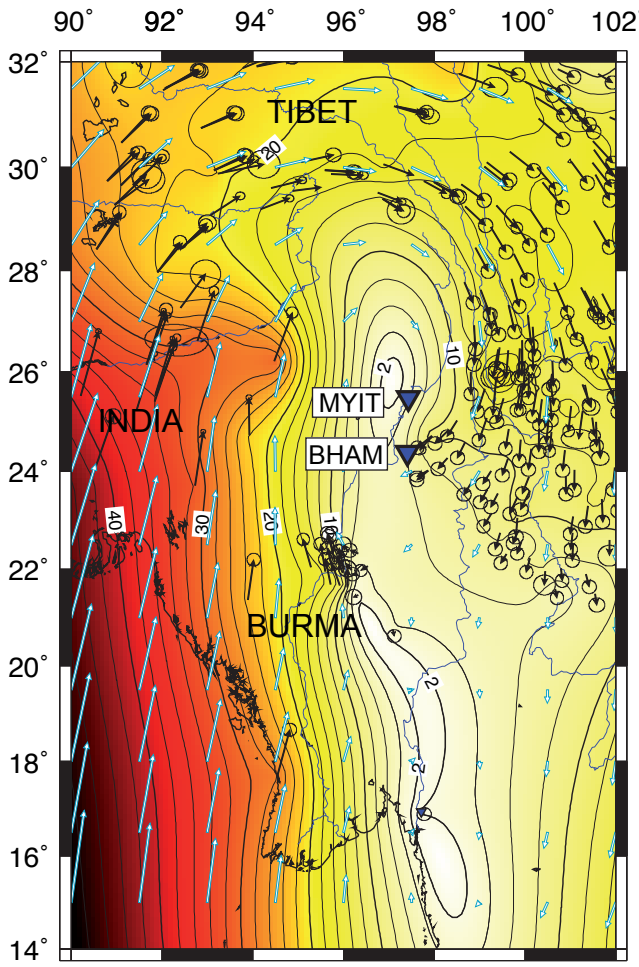
(b)

Site	Longitude (°)	Latitude (°)	East Offset (mm)	North Offset (mm)
BHAM	97.391	24.317	0.232	-1.425
INND	95.837	23.767	0.469	-1.113
KATH	96.316	24.17	0.382	-1.155
MOGA	96.774	25.311	0.270	-0.937
MYIT	97.415	25.415	0.206	-1.044
NAMT	97.023	25.344	0.246	-0.983
NAMY	96.539	25.601	0.273	-0.815
PEIN	96.041	23.892	0.435	-1.151
PHAK	96.305	25.59	0.289	-0.767
PUTA	97.383	27.335	0.156	-0.624
TANA	96.7	26.318	0.227	-0.701
WUNT	95.72	23.813	0.475	-1.050

Figure S1: (a) Map of the cumulated offset resulting from the postseismic relaxation that followed the December 24th 2004 Sumatra Andaman Earthquake (Mw 9.1). We have used the postseismic relaxation model of Pollitz et al. (2006) - which uses the coseismic slip model of Banerjee et al., (2007). We have computed the postseismic offset cumulated between the two geodetic campaigns, performed in April 2005 and October 2008. The resulting cumulated displacements are presented on table (b).

The cumulated postseismic offset induced by the Sumatra Andaman earthquake is less than 1.5mm, thus less than 0.6mm/yr between April 2005 and October 2008. This is negligible regarding the minimum 1.1mm/yr error of the measured velocities. Furthermore, it is negligible regarding the large 18mm/yr slip rate (Vigny et al., 2003) that we aim to detect along the Sagaing fault.

(a)



(b)

SITE	LON (°)	LAT (°)	VE (mm/yr)	VN (mm/yr)
BHAM	97.408	24.331	-5.47	-2.38
MYIT	97.433	25.433	-2.64	-2.68

Figure S2: (a) Map of the velocity field obtained by a simple interpolation on basis of published geodetic data (Gan et al., 2007; Banerjee et al., 2008) and our own processing of Central and Southern Myanmar data (Vigny et al., 2003; this study). The interpolation was performed on a 0.01° grid with an adjustable tension continuous curvature surface gridding algorithm ('surface' command from the Generic Mapping Tools (GMT): Smith and Wessel, 1990). A very good fit was obtained between the interpolated velocity field (blue arrows) and the 190 data (rms=0.02mm/yr). Both original data and interpolated velocities are represented with respect to stable Eurasia using the Euler rotation pole from Altamimi et al. (2002): 57.965°N, -99.374°E, 0.260°/Ma.

BHAM and MYIT GPS sites (inversed blue triangles) are both strongly influenced by the deformation observed East of Myanmar. The interpolated velocities calculated at these two sites are given in the table (b). The so predicted offset at BHAM and MYIT is free from the influence of the Sagaing fault as no GPS data around the fault were introduced nearby the sites in the interpolation process.

The displacement of MYIT and BHAM induced by the Sagaing fault alone can then be simply obtained by subtracting the above-calculated offset to the measured offset. The result is given in table S1.

Profile 1

	Locking Depth fixed						Best fit
Locking Depth (km)	0	5	10	15	20	25	**7.7**
Dislocation offset (km)	unconstr.	10.4	4.5	2.8	1.9	1.1	**6.2**
Slip rate (mm/yr)	18.4	20	22.2	24.6	27.1	29.6	**21.2**
RMS	0.64	0.43	0.44	0.71	1.03	1.32	**0.31**

Profile 2

	Locking Depth fixed						Best fit
Locking Depth (km)	0	5	10	15	20	25	**6.3**
Dislocation offset (km)	unconstr.	10.5	9.8	9.1	8.0	6.7	**10.2**
Slip rate (mm/yr)	17.4	19.4	21.9	24.0	26.0	28.0	**20.1**
RMS	0.85	0.37	0.63	1.21	1.66	2.01	**0.30**

Profile 3

	Locking Depth fixed						Best fit
Locking Depth (km)	0	5	10	15	20	25	**20.3**
Dislocation offset (km)	10.8	10.3	11.1	11.6	12.1	12.4	**12.1**
Slip rate (mm/yr)	13	15.7	18	20.2	22.3	24.3	**22.4**
RMS	2.28	1.79	1.55	1.42	1.39	1.41	**1.39**

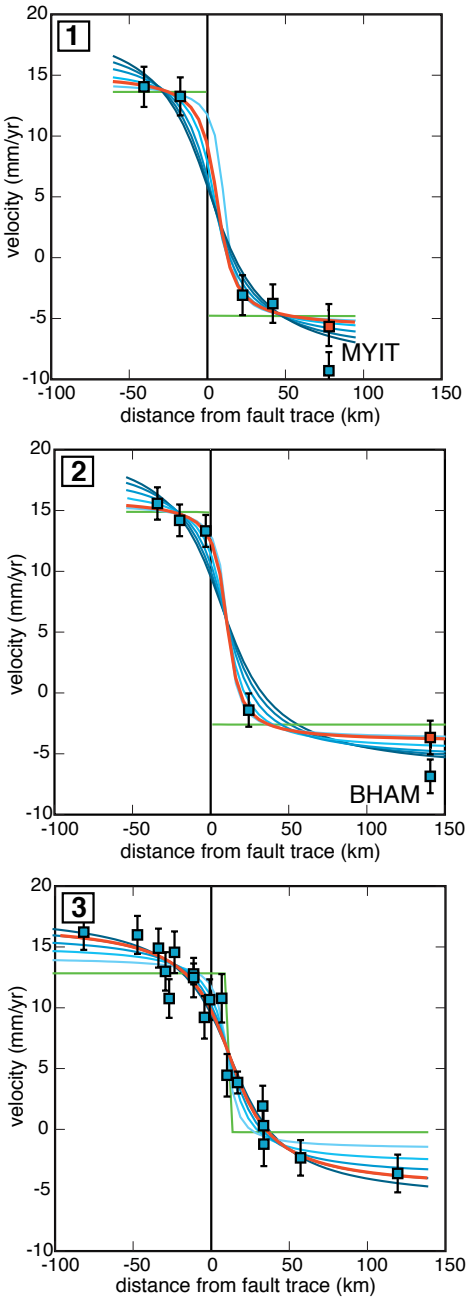


Figure DR3: 2D Elastic modeling for three profiles along the Sagaing fault. Profiles are located in figure 1. Blue rectangles are the measured velocity at each GPS sites projected along the direction of the fault trace. Red rectangles are the corrected velocity for BHAM and MYIT sites (see text for details). Tables show the results of the inversion for each profile with fixed locking depth (0, 5, 10, 15, 20 and 25 km) and with all parameters free. The column and the corresponding curve have the same color.

	SITE	LONG	LAT		ITRF 2000 VE	VN		EURASIA VE	VN EE	EN CORR
North Myanmar sites										
	BHAM	97.408	24.331	25.96	-11	-2.42	-6.57	1.24	1.22	0.011
									(3.05)	(-4.19)
	INND	95.872	23.799	26.05	10.65	-2.34	14.68	1.17	1.15	0.007
	KATH	96.329	24.177	28.18	-5.54	-0.22	-1.39	1.23	1.21	0.004
	MOGA	96.806	25.325	25.95	-6.41	-2.5		-2.14	1.22	1.2
	MYIT	97.433	25.433	25.31	-13.31	-3.13	-8.88	1.13	1.12	0.004
									(-0.48)	(-6.19)
	NAMT	97.024	25.359	25.55	-7.04	-2.9		-2.71	1.17	1.16
	NAMY	96.562	25.626	33.3	8.27	4.82	12.48	1.16	1.15	0.006
	PEIN	96.043	23.929	29.28	9.21	0.88	13.29	1.2		1.18
	PHAK	96.318	25.615	33.82	8.94	5.34	13.09	1.23	1.21	0.005
	PUTA	97.4	27.35	35.84	-10.76	7.33	-6.33	1.17	1.16	0.004
	TANA	96.73	26.332	35.5	6.23	7		10.48	1.21	1.19
	WUNT	95.75	23.848	29.71	11.55	1.31	15.55	1.19	1.17	0.004
Central and southern Myanmar sites										
	BODA	96.111	22.36	25.27	0.36	-3.02	4.45	1.82	1.75	-0.012
	CHAU	95.919	21.672	23.89	8.44	-4.35	12.48	1.67	1.62	-0.011
#	HPAA	97.715	16.938	29.39	-5.92	1.67	-1.41	1.71	1.55	-0.001
	HTIS	95.595	21.962	25.63	12.03	-2.64	15.99	1.61	1.56	0
	KINV	96.323	21.473	25.55	-5.36	-2.66	-1.21	1.92	1.81	-0.01
	KUNT	96.317	22.324	23.49	-2.23	-4.79	1.92	1.74	1.67	0.003
#	KWEH	95.286	22.049	23.71	12.34	-4.58	16.22	1.48	1.46	0.001
#	LAUN	94.537	17.692	35.20	23.48	7.33	27.17	1.71	1.57	0.001
	LEGY	95.757	21.986	25.51	8.99	-2.76	12.99	1.63	1.58	-0.002
	LEPA	96.011	22.003	25.78	6.60	-2.48	10.67	1.73	1.67	-0.007
	MIND	93.897	21.383	31.58	19.77	3.32	23.29	1.60	1.53	0
	MYOT	95.716	21.691	25.20	10.91	-3.05	14.90	1.65	1.60	-0.003
	NYAN	96.081	21.636	28.35	6.69	0.12	10.78	2.10	1.99	-0.035
#	SAYE	95.919	21.991	27.99	8.74	-0.27	12.78	0.87	0.86	0.005
	TAUN	97.094	20.75	28.82	-7.97	0.69	-3.62	1.65	1.55	-0.004
	THIT	95.809	22.162	24.71	10.54	-3.57	14.56	1.78	1.71	-0.002
	TNYO	95.981	21.934	24.81	5.15	-3.45	9.21	1.88	1.75	0
	WETL	95.778	22.367	24.65	6.75	-3.65	10.76	1.63	1.59	0

#	YANG	96.172	21.989	24.93	-0.25	-3.33	3.86	0.91	0.90	0.001		
#	YWEN	96.535	22.06	24.25	-6.54	-4.00	-2.34	1.48	1.46	0.001		
	ZIBI		96.321	21.89	24.98	-3.84	-3.27	0.31	1.66	1.62	-0.004	

IGS stabilisation sites

	RES-E	RES-N									
GUAM	144.868	13.589	-9.77	1.75	-35.16	15.56	0.57	0.57	0.00	1.23	-0.56	
IISC		77.57	13.021	43.05	33.19	15.72	32.37	0.58	0.58	-0.01	2.37	-0.68
IRKT	104.316	52.219	24.69	-7.94	-1.42	-1.78	0.59	0.59	0.00	0.01	0.75	
KARR	117.097	-20.981	38.63	57.14	20.16	66.26	0.56	0.56	-0.01	0.50	0.03	
KIT3	66.885	39.135	28.10	3.81	-0.31	0.17	0.60	0.60	0.00	0.14	-0.28	
KUNM	102.797	25.03	29.78	-20.76	1.56	-14.97	0.60	0.60	0.00	-1.76	-0.37	
POL2	74.694	42.68	27.80	3.81	-0.56	2.23	0.60	0.60	0.00	0.02	0.98	
POTS	13.066	52.379	19.42	14.16	-0.18	-0.01	0.45	0.43	0.03	0.10	-0.08	
SHAO	121.2	31.1	31.34	-15.09	4.34	-5.12	0.59	0.59	-0.01	-0.72	-0.35	
TIDB	148.98	-35.399	18.05	54.70	1.35	68.95	0.38	0.38	-0.06	-0.38	-0.16	
WUHN	114.357	30.532	31.36	-13.49	3.77	-4.97	0.59	0.59	-0.01	-1.42	0.01	
ZECK	41.565	43.788	25.52	9.99	-0.41	0.33	0.56	0.56	0.00	-0.58	0.75	

Table S1: Velocities measured at each GPS sites from the Northern Burmese GPS network measured in 2005 and 2008, and from the central Myanmar network measured in 1998 and 2000. Values are given in the ITRF 2000 reference frame (Altamini et al., 2002) and in the Eurasian reference frame using the Eurasian/ITRF2000 Euler rotation pole: 57.965°N, -99.374°E, 0.260°/Ma (Altamimi et al., 2002). Values indicated between brackets at BHAM and MYIT sites are those corrected from the deformation observed east of Myanmar (see figure S2 for details). Velocities and residuals velocities of IGS stations used for mapping the combined solution with respect to the ITRF 2000 are also provided.

Sites remeasured in 2005.

Longitude (°)	Latitude (°)	East Offset (mm)	North Offset (mm)	Total Offset (mm)	Azimuth of displacement	Site name	Relative to Kweh (mm)
95.286	22.049	-1.320	-6.840	6.966	190.923	KWEH	0.000
95.919	21.991	-2.100	-8.410	8.668	194.020	SAYE	1.702
96.172	21.989	-2.440	-8.980	9.306	195.201	YANG	2.339
96.535	22.060	-2.880	-9.610	10.032	196.683	YWEN	3.066

Table DR2: Coseismic displacement predicted at the four GPS sites, from central Myanmar, re-measured after the Sumatra Andaman Earthquake. We have used the coseismic rupture model of Banerjee et al. (2007). The last column provides the predicted displacement with respect to KWEH.