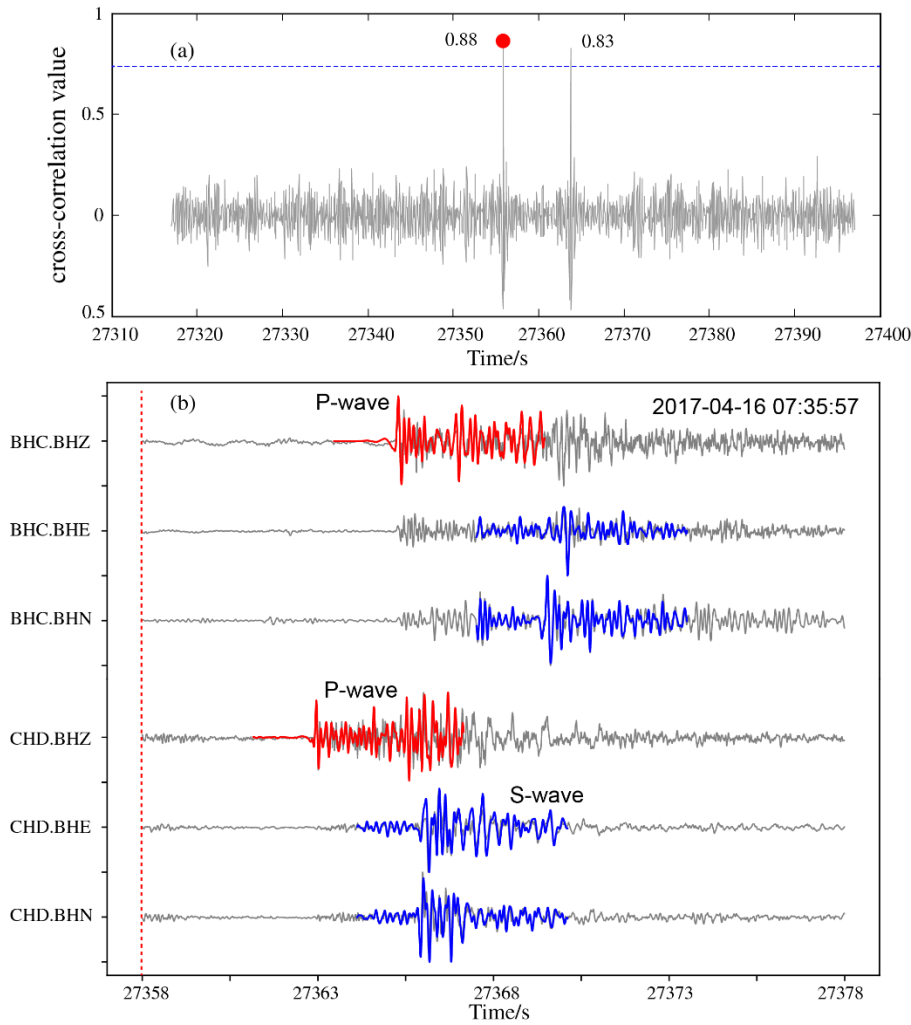


1 Supplementary Material



2
3 **Figure S1.** (a) Mean CC after migration of time (blue dotted line represents the threshold; red
4 dot represents detected events). The horizontal axis is sampling point corresponding to time,
5 sampling rate is 100. (b) Example of a detected $M_L 2.6$ event at 07:35:57 on 16 April 2017 (gray
6 waveform). It is detected by the template from $M_L 3.0$ event at 09:40:46 on 15 April 2017, its P-
7 wave is the red line and S-wave is the blue line. Red dotted line is the origin time of earthquake
8 corresponding to the horizontal ordinate of red dot in Figure 2a.

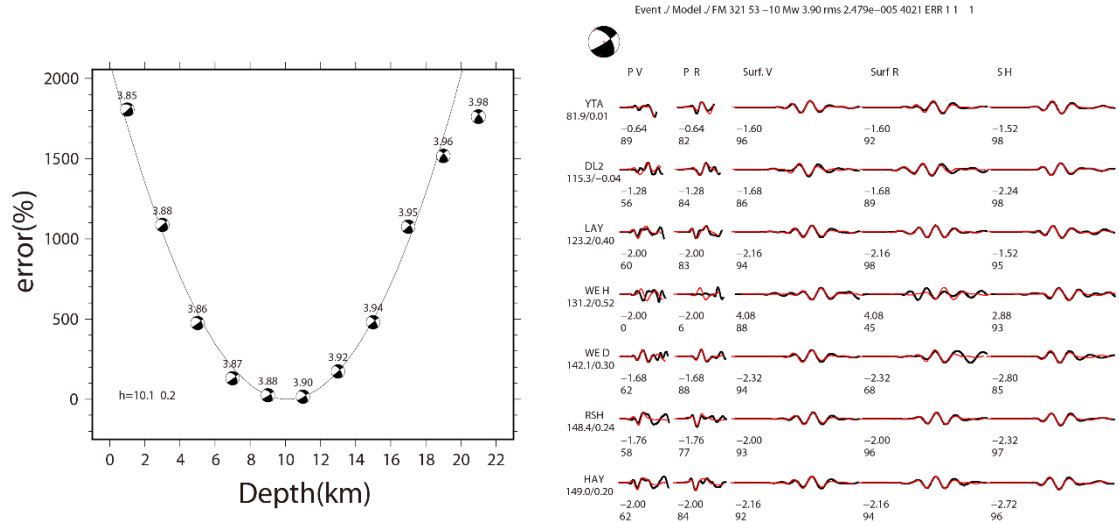


Figure S2. Example of calculating focal mechanism using CAP method. The earthquake was 2017-03-21 00:54:40 $M_L 4.1$, the corresponding focal mechanism solution was strike-slip with positive fault component; the right figure was the fitting diagram of body wave and surface wave of each station, which shows that the fitting was good.

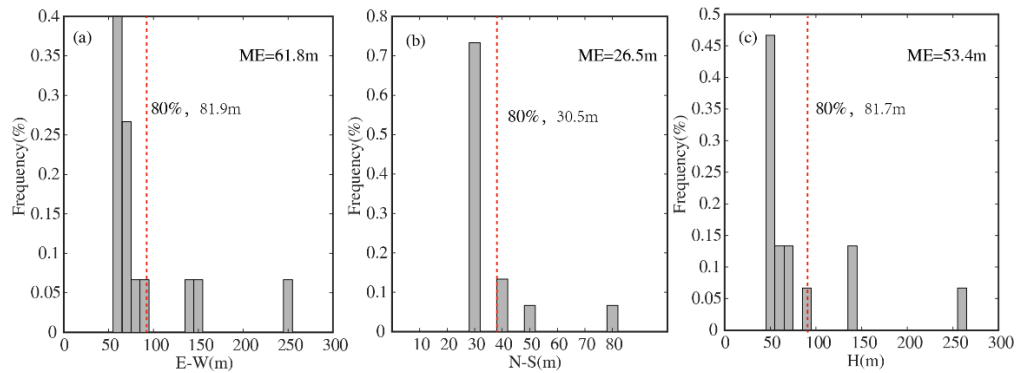


Figure S3. The errors of all earthquakes in the horizontal and vertical directions. ME indicated the median value of earthquakes in the direction. The red line mark 80% errors. We selected 90 events on February 14, 2017 (with magnitude range of 0.5-2.8) based on singular-value decomposition (SVD) option in the hypoDD. The median location errors and 80% errors of horizontal and vertical directions were also less than 100 m in the horizontal and depth directions. These values suggested that the horizontal separation of ~ 0.5 km for parallel sections were likely not due to location uncertainties.

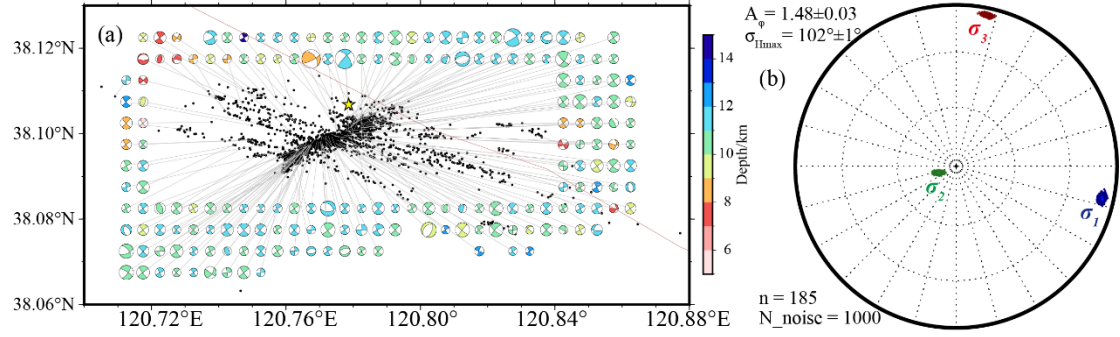


Figure S4. Focal mechanisms of the earthquakes with magnitude larger than 2 and the stress inversion result. The color in (a) indicated the depth. The stress tensor was inverted using the iterative stress inversion [Vavryčuk, 2014; Levandowski et al., 2018]. A_φ was the stress ratio and σ_{Hmax} was the horizontal principal stress orientations, n was the counts of the earthquakes and repeated 1000 times jackknife Stress inversion.

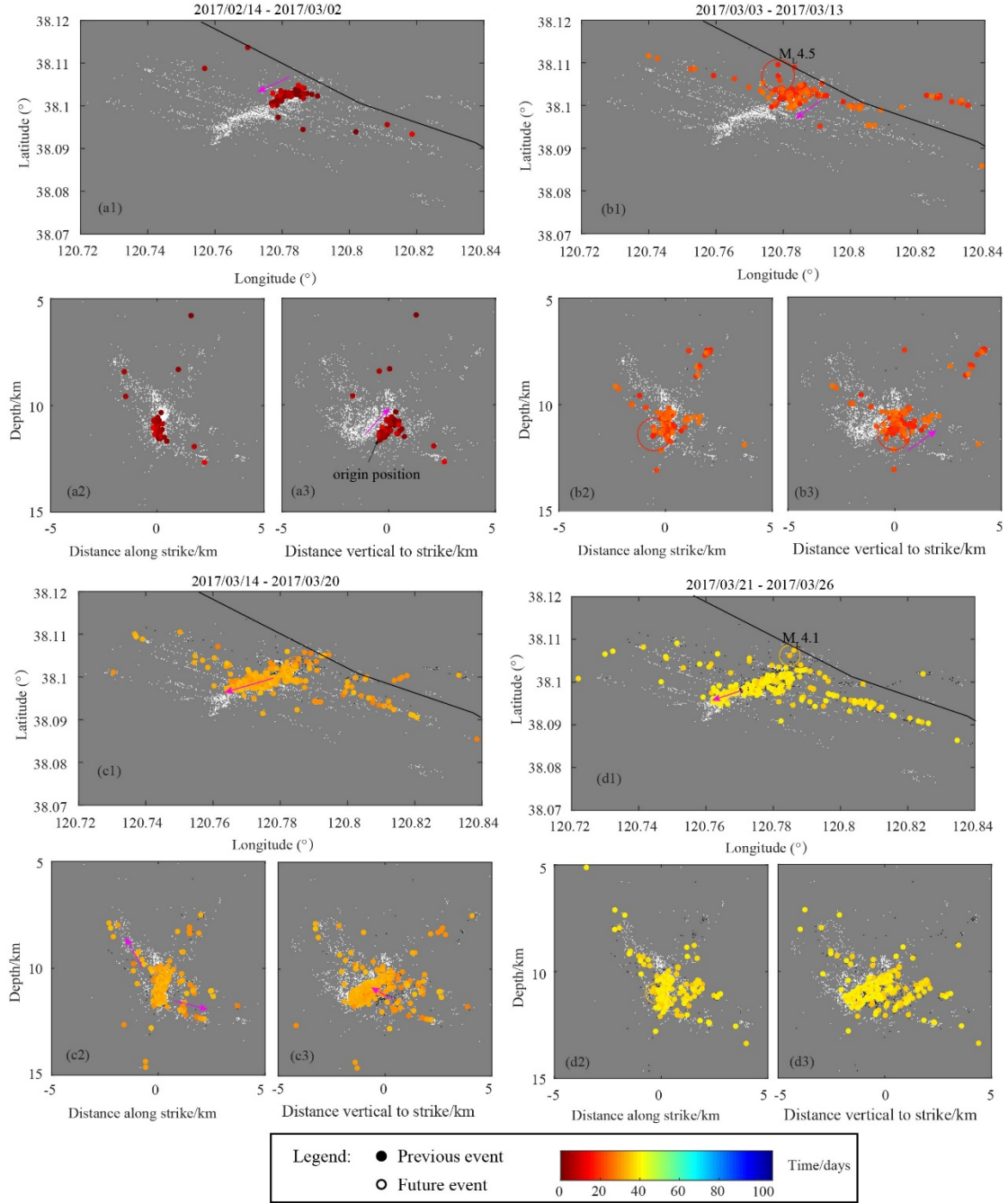


Figure S5. Space-time progression of swarm earthquakes. Each frame shows a map view on top and two cross-sectional views on the bottom. The color indicates the occurrence time, as shown in Figure 3. The hollow circles indicate the rupture areas of earthquake greater than 3 based on an assumption of 3 MPa stress drop. Black points showed events occurring before the frame, while those occurring afterward were white. The purple arrows indicated the expand direction.

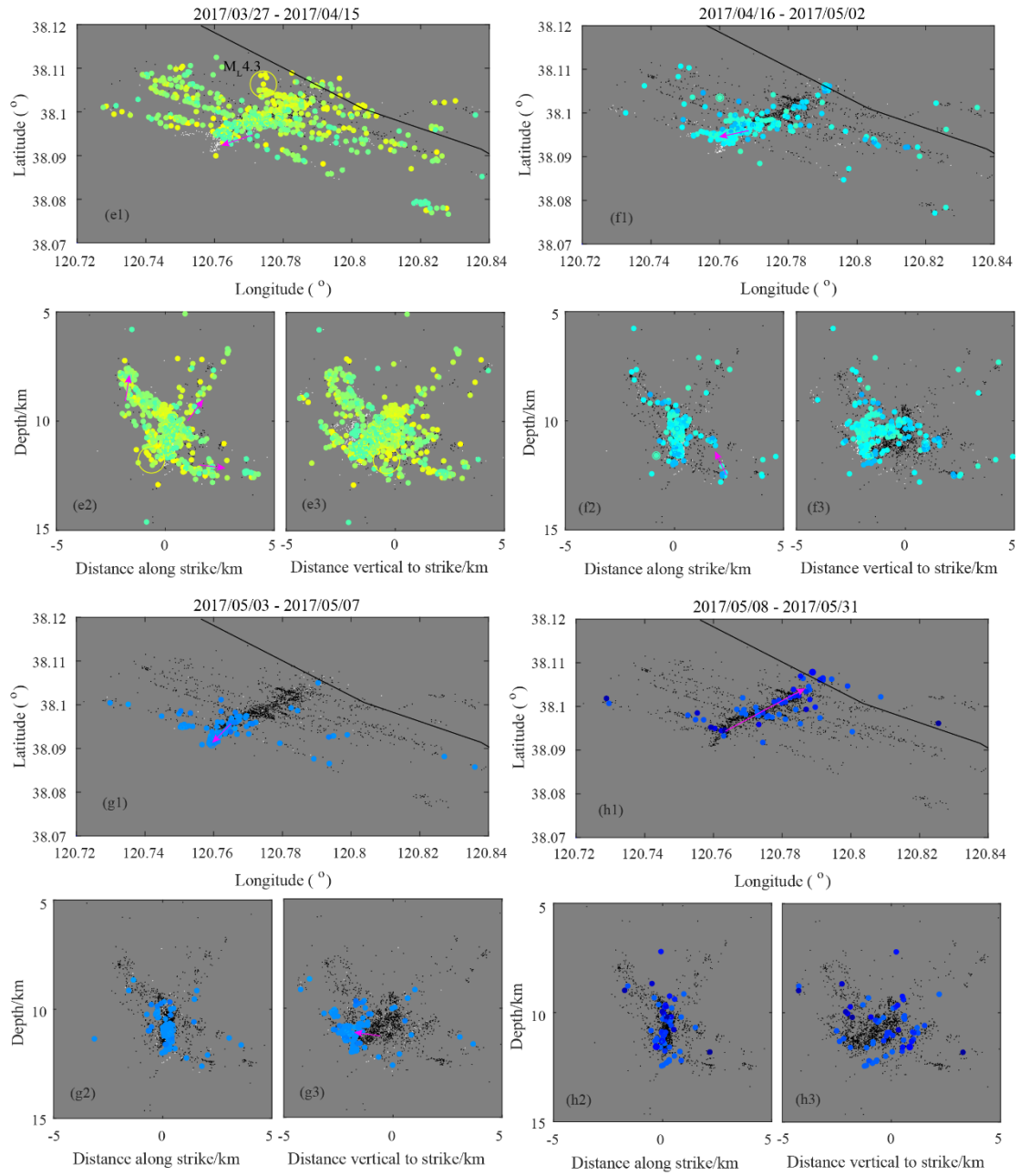


Figure S6. Space-time progression of swarm earthquakes(continue).

