Precursory swarms of moderate-sized earthquakes in eastern Taiwan

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We investigate the correlation between swarm and large earthquakes for the events occurred in an area near the transition corner from subduction to collision in eastern Taiwan between 1991 and 2008. We systematically identify seventeen swarms that have more than fifty earthquakes ($M < 4.3$) occurring within one month interval and find that six out of seventeen earthquake swarms located at similar area and formed a specific seismic zone occurred 1-48 days preceding nearby moderate-sized earthquakes with distances less than 40 kilometers. The specific seismic zone where the swarms located is twelve kilometers long, three kilometers wide and having a depth range between eight to twelve kilometers in the northern end of the Taiwan collision plate boundary. The moderate-sized earthquakes ($5.5 < M < 6.3$) presumably occurred along the east-dipping thrust fault, while the preceding swarms appear to locate along the west-dipping conjugate back-thrust. The accumulated moments of the preceding swarms are inversely related to the time-separation between the precursory swarms and the $M > 5.5$ earthquakes. An asperity model may explain the earthquake preparatory processes observed from the precursory swarms-mainshock sequences found at the collision corner of eastern Taiwan.