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Seismogenic characteristics of the Gukeng fault, southwestern Taiwan: Insights from detecting ambient tremors

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We have analyzed seismic waveform recorded by broadband stations deployed by the Central Weather Bureau during 2014 to detect ambient tremors along the Gukeng creeping fault in southwestern Taiwan. Ambient tremors have been found worldwide in subduction zones as well as fault zones. The discovery of ambient tremor has been played an important role in understanding the whole spectrum of seismogenic process in active tectonic regions. In addition, ambient tremor could act as a warning signal for changing of faulting behavior from creeping to accelerating slip, which may provide a crucial key in seismic hazard assessments. The Gukeng fault located in southwest Taiwan is a strike-slip fault with distinct interseismic deformation. We found that the seismic moment release rate for the Gukeng fault zone is relatively low compared with its surface deformation. The seismic energy deficiency may partly be attributed to the energy release by the burst of tremors. We detected and located tremors around the Gukeng fault zone by applying an approach including bandpass filtering between 2-5Hz, noise reduction, normalized cross correlation of waveform envelop, and grid search methods. One interesting feature found in our preliminary results shows that the duration of tremors occurring on the creeping zone of the Gukeng fault area is usually very short and located beneath the locking depth.