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Across-canyon movement of earthquake-induced sediment gravity flow offshore southwestern Taiwan.

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Caused by the origin of oblique collision between the Eurasian and Philippine Sea Plate, Taiwan Island inevitably faces the destiny to be continuously influenced by frequent and severe earthquake activities. Thus, earthquake-induced sediment gravity flows are common marine geo-hazards in the submarine region of Taiwan. The Pingtung Doublet earthquakes occurred in Dec. 2006 offshore Fangliao Township and two submarine cables were broken at the Fangliao Submarine Canyon (FLSC) head, simultaneously. On the eastern side of the FLSC head, chirp sonar profiles and high-resolution bathymetry data revealed linear seafloor failures along the northwest direction and merged into the FLSC. Moreover, cores taken from the seafloor failure area and in the FLSC also observed thick debrite and turbidite layers at core tops. Nevertheless, in the western side of the FLSC head, local fishermen reported disturbed water just after the Pingtung Doublet earthquakes. Hence series of cores and chirp sonar data were collected at the western side of the FLSC, trying to figure out the linkage of Pingtung Doublet earthquakes induced gravity flow deposits on both sides of the FLSC. The analysis results suggest that the deposits of disturbed water at the western side of FLSC head was caused by the finer suspended sediments separated from the main body at the top of the gravity flow. Our results point out besides the traditional well-known downward transportation in the canyon, the across-canyon movement may also leave stratigraphic records and help us to establish a more complete transportation process of a sediment gravity flow.