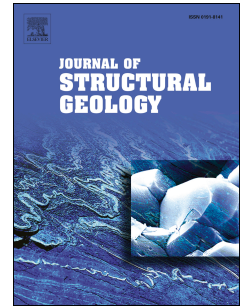


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Deformation bands in volcanoclastic rocks – Insights from the Shihtiping tuffs, Coastal Range of Taiwan

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1 **Deformation bands in volcanoclastic rocks – insights** 2 **from the Shihtiping tuffs, Coastal Range of Taiwan**

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9 10 **Abstract**

11 Deformation bands have been extensively studied in sandstones, whereas far
12 less is known about bands occurring in porous volcanoclastic rocks. Here we
13 investigate spectacular outcrop exposures of late Miocene tuffaceous rocks in the
14 Coastal Range of Taiwan, which host several deformation band types: (i)
15 disaggregation-dominated, layer-bound, sub-vertically-dipping pure compaction
16 bands (PCB); (ii) cataclastic, layer-bound, reverse-sense compactional shear bands
17 (RCSB); and (iii) non-layer-bound and intensely cataclastic transverse-sense
18 compactional shear bands (TCSB). RCSBs and TCSBs host discrete slip surfaces
19 on individual bands. The bands formed in an overall compressive stress regime
20 related to convergence of the Eurasian and Philippine Sea plates. PCBs and
21 RCSBs formed first, whereas progressive burial caused a shift to a transverse
22 stress state and formation of TCSBs. The occurrence of cataclasis in RCSBs but
23 not PCBs is inferred to be shear-driven, rather than confining-pressure-driven. Our
24 findings suggest that cataclasis in deformation bands in volcanoclastic rocks is

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