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1 Clusters of Cataclastic Deformation Bands in porous sandstones

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13 **Keywords:** sandstone, deformation, cluster, cataclastic band, fault

14 **ABSTRACT**

15 Clusters of cataclastic deformation bands represent potential barriers or baffles to reservoir fluid
16 flow, and their processes of formation remain debated. In this work, we rely on an integrated field
17 study at seven sites to describe the extent of clusters, their morphology and their density of
18 deformation as a function of several parameters: the tectonic loading, the burial depth of
19 deformation, the Andersonian stress regime and the lithology of the sandstone. We perform
20 porosity, sorting and grain shape analyses of the deformed material to improve the understanding
21 of microscopic process of cluster development. In agreement with previous works on cataclastic
22 deformation bands, our results reveal that the tectonic loading constrains the extent and the
23 morphology of the clusters. Extensional tectonics favors the formation in normal-fault
24 Andersonian regime of series of hundreds of meter long, rather thin and dense clusters, forming
25 kilometer long networks associated to faults. We find that the formation of major slip-surfaces

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