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3D reconstruction of a normal fault zone: A trenching study on a strand of the active Baza fault, Central Betic Cordillera, south central Spain

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Faults are rarely a discrete two-dimensional surface, but a three dimensional volume with a complex internal structure. Faults are commonly encountered in reservoirs and evaluated for their ability to act as a fluid flow conduit or barrier. The problem is that the structure of a fault zone in 3D is poorly understood, particularly because outcrops exposing fault zones in 3D are rare, and few have a large (e.g. 100 m) throw. Detailed 3D outcrop studies of fault zones can help provide insight into their internal structure, and the processes undergone during faulting, as well as improve the predictability of subsurface (e.g. reservoir) models. The main objective of this project is to construct a 3D structural model of a strand of the Baza fault, an active normal fault located in south central Spain in the Betic Cordillera. This strand is one of the many strands of the Baza fault system, and has an estimated throw of 30 meters in a relatively unconsolidated clay to silt Pliocene sequence. Through a trenching study, 10 vertical dip sections, 3 vertical strike sections, and one depth section in an area of approximately 80 m^2 were excavated, cleaned, Lidar scanned, photographed, and documented. Based on these sections, we have reconstructed the 3D geometry and associated structures of this superb fault zone. These data can be used to study the variability of fault zones in 3D, but also for geophysical (e.g. seismic imaging) and reservoir modeling studies.