



Photogrammetric Digital Outcrop Model analysis of a segment of the Centovalli Line (Trontano, Italy)

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The Centovalli Line is a complex network of brittle faults developing between Domodossola (West) and Locarno (East), where it merges with the Canavese Line (western segment of the Periadriatic Lineament). The Centovalli Line roughly follows the Southern Steep Belt which characterizes the inner or “root” zone of the Penninic and Austroalpine units, which underwent several deformation phases under variable P–T conditions over all the Alpine orogenic history. The last deformation phases in this area developed under brittle conditions, resulting in an array of dextral-reverse subvertical faults with a general E–W trend that partly reactivates and partly crosscuts the metamorphic foliations and lithological boundaries.

Here we report on a quantitative digital outcrop model (DOM) study aimed at quantifying the fault zone architecture in a particularly well exposed outcrop near Trontano, at the western edge of the Centovalli Line.

The DOM was reconstructed with photogrammetry and allowed to perform a complete characterization of the damage zones and multiple fault cores on both point cloud and textured surfaces models.

Fault cores have been characterized in terms of attitude, thickness, and internal distribution of fault rocks (gouge-bearing), including possibly seismogenic localized slip surfaces.

In the damage zones, the fracture network has been characterized in terms of fracture intensity (both P10 and P21 on virtual scanlines and scan-areas), fracture attitude, fracture connectivity, etc.