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The Tectono-geomorphic features of Apennine Fault Scarps Mapped Using Combined Ground Penetrating Radar and Terrestrial Laser Scanning

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Greater knowledge of the geomorphological setting of faults and consequently, more accurate paleoseismological interpretations can provide the framework for more reliable assessments of the long term seismic hazards posed by normal faults in the Apennines. Using combined ground penetrating radar (GPR) and terrestrial laser scanning (TLS) datasets we present a study of the tectono-geomorphic expression of bedrock fault scarps in the central Apennines. Previous investigations have highlighted the challenges in the interpretation of these structures resulting from the differentiating between those scarps formed by recent tectonic exhumation and those by geomorphological exhumation. This problem may only be overcome by detailed investigation of the tectono-geomorphological setting of each fault. Our work on three Apennine fault scarps illustrates that the surface expression of the scarps result from the interaction between footwall incision, hanging wall sedimentation, channel incision and landsliding as well as fault slip rates and fault linkage. Increased understanding of these mechanisms will aid our understanding of the complicated relationship between bedrock faulting and geomorphic processes, contributing to improved understanding of seismic hazards in the central Apennines.