An example of slip on a capable fault: Near-field co-seismic deformation of the 30<sup>th</sup> October Central Italy earthquake (6.6 Mw) measured using low-cost GNSS

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Capable faults and the ground motions they produce in the near-field are of great importance to the construction of major infrastructure facilities such as nuclear plants, yet few datasets exist to constrain these effects. Here we present a record of co-seismic displacement of the 30<sup>th</sup> October Central Italy earthquake measured in the near-field using low-cost GNSS, an example of co-seismic slip on a capable fault. Four low-cost GNSS units were installed across the causative Mt. Vettore fault as two footwall-hangingwall pairs with baselines of 1,286 m and 1,870 m with an along-strike separation of 6.2 km. The displacement records reveal near-synchronous co-seismic displacement along each baseline, values of finite co-seismic displacement, rise-time and rupture velocity. A rigorous comparison of these values has been conducted using independent datasets of displacement and acceleration derived from regional GPS, InSAR, a local strong motion station and mapping of surface ruptures which intersect the two baselines. This comparison and analysis, whilst not without discrepancy, validates low-cost GNSS for the first time as an appropriate method for the temporal measurement of near-field co-seismic displacement. The derived empirical values will benefit the process of fault rupture modelling and accurate ground motion prediction in the near-field of capable faults worldwide.

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