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The rock avalanche of the Mt. Peron (Eastern Alps, Italy): new insights from 36Cl exposure dating

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In the Late Pleistocene, in the southern side of the Eastern Alps (Veneto region, Italy), when the glacier tongues retreated from the end moraine system areas towards the Dolomitic region, large rock avalanches took place. In the Belluno Valley, occupied by the Piave river, the left side is represented by the Belluno Prealps range, corresponding to the northern flank of a km-scale WSW-ENE oriented alpine syncline formed by rocks from Late Triassic to Late Tertiary in age. The Mt. Peron, belonging to this mountain range, shows its southern lower slope covered by debris cones with scattered boulders and its higher slope, corresponding to the scarp, made of vertical rock strata. At the foot of Mt. Peron, at a distance varying from 500 to 4500 m, there is a 4.5 km2 fan like area delimited by a perimeter of about 15 km. This is a hilly area of poortly sorted, chaotic deposits composed of heterogeneous debris, sandy and silty gravels, angular blocks and very large boulders of carbonatic rocks up to 20 m in diameter. The average thickness of the deposit was estimated to be 80 m, with maximum of 120 m.

According to previous works, the main event occurred during the first phases of deglaciation, between 17,000 and 15,000 years BP. Popular stories narrate about two legendary villages destroyed by a mass of stones rolling down in the valley. This is confirmed by archeological findings in the Piave valley which indicate the presence of almost one pre-historic settlement dating 40000-20000 years a B.P., (i.e. before the Last Glacial Maximum)..

Recent 36Cl exposure dating have yielded historical ages for both the boulders at the foot of the Mt Peron and those located a few km far from the main scarp. According to these exposure ages we can not exclude the hypothesis that earthquakes related to the Venetian faults could have played a key role for triggering of the rock avalanche and that the main gravitational event took place in historical times rather than during the deglaciation.