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## Exploring the effect of instream boulders on large wood transport combining numerical modelling and field experiments

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Large and relatively immobile sediment particles (i.e., boulders, usually defined with a diameter greater than 256 mm) are naturally delivered to rivers from hillslopes, transported by extreme floods, or produced by processes such as bed armouring. Boulder placement is also used as an artificial method for stabilizing channel beds and banks in river restoration projects. Natural or reintroduced boulders are important elements with a significant influence on channel hydraulics, erosion and deposition dynamics, and morphology. Still, little is known about their effect on large wood transported as floats along the river.

A field experiment was performed to track the mobility of cylindrical wood elements artificially placed in a reach of the Rienz River upstream from the city of Brunico, in South Tyrol (Northern Italy) and transported along a few kilometres over a period of three years. The Rienz River is a single thread sinuous gravel-bed river, characterized by the presence of several large boulders. Combining available field observations and 2D numerical modelling (coupling a 2D flow and a Lagrangian calculation of wood elements), this work aims to test the effect of boulders on both the river ecohydraulics and large wood transport. First, a detailed topography was obtained combining an available digital elevation model (2 m resolution) with topographical surveys. Second, the numerical model (i.e., Iber-Wood) has been calibrated with flow depths observations and the wood travel distances recorded during one high flow event were used for validation of the Lagrangian calculation. Finally, different scenarios with different boulder rearrangements are currently run to explore the effects of boulders size and location distribution on both wood transport and river ecohydraulics. This contribution will show preliminary results and discuss how boulder-rich channels differ from boulder-free channels in terms of large wood transport and deposition.