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Description and analysis of the debris flows occu during 2008 in the Eastern Pyrenees

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Abstract. Rainfall-triggered landslides taking place in the Spanish I Pyrenees have usually been analysed on a regional scale. Most re focussed either on terrain susceptibility or on the characteristics of critical rainfall, neglecting a detailed analysis of individual events. I contrast to other mountainous regions, research on debris flow ha been performed marginally and associated hazard has mostly bee neglected.

In this study, five debris flows, which occurred in 2008, are selecte site specific descriptions and analysis regarding geology, morpholo rainfall data and runout were performed. The results are compared worldwide data and some conclusions on hazard assessment are presented.

The five events can be divided into two in-channel debris flows an landslide-triggered debris flows. The in-channel generated debris f exceeded 10 000 m^3, which are unusually large mass movements compared to historic events which occurred in the Eastern Pyrenee contrast, the other events mobilised total volumes less than 2000 geomorphologic analysis showed that the studied events emphasi similar patterns when compared to published data focussing on slo angle in the initiation zone or catchment area.

Rainfall data revealed that all debris flows were triggered by high i short duration rainstorms during the summer season. Unfortunatel existing rainfall thresholds in the Eastern Pyrenees consider long-l rainfall, usually occurring in autumn/winter. Therefore, new thresh should be established taking into account the rainfall peak intensit mm/h, which seems to be a much more relevant factor for summer event's total precipitation.

The runout analysis of the 2008 debris flows confirms the trend th volumes generally induce higher mobility. The numerical simulation Riu Runer event shows that its dynamic behaviour is well represen Voellmy fluid rheology. A maximum front velocity of 7 m/s was back

analysed for the transit section and even on the fan velocities larg
2 m/s were obtained.

This preliminary analysis of the major Eastern Pyrenean debris flo
represents the first background for future studies. Additional resea
other events is necessary to support the results presented herein
properly assess and reduce hazard related to debris flows.

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