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Characterizing avalanches occurred in the 2009-2010 winter seasons in Friuli-Venezia Giulia and Veneto regions in North-eastern Italy with seismic stations

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The Regional Agency for the Environmental Prevention and Protection of Veneto (Agenzia Regionale per la Prevenzione e Protezione Ambientale del Veneto, ARPAV) was established in October 2007 to monitor and prevent environmental risks in the Veneto region, in North-eastern Italy: the Regione Autonoma Friuli-Venezia Giulia Direzione Centrale Risorse Agricole Naturali e Forestali has the same duties on its territory. The Italian National Institute for Oceanography and Experimental Geophysics (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, OGS), after the strong earthquake (magnitude M=6.4) occurred in 1976 in the Friuli-Venezia Giulia region, started to operate the North-East Italy (NI) seismic network: it currently consists of 11 very sensitive broad band seismic stations and 23 more simple short period seismic stations, all acquired in real time. OGS also exchanges seismic data with other Italian, Austrian, Slovenian and Swiss agencies in the surrounding areas, which gives a total number of 89 stations acquired in real time. This makes the OGS the reference agency for the monitoring of the seismic activity in North-eastern Italy.
Detecting avalanches by means of seismic stations is indeed a difficult job because of the poor snow-to-earth coupling and the high dumping of the snow: nevertheless previous studies of the authors indicated that even a classic seismic network devoted to real time seismic monitoring can detect avalanches of medium-big size. In this work we analyze the classic parameters of the seismic recordings (such signal duration and magnitude) and relate them to the main physical characteristics of the avalanches (like run-out, mass, potential energy) occurred in the the 2009-2010 winter seasons in Friuli-Venezia Giulia and Veneto regions in North-eastern Italy.