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Permafrost and rock falls in high mountain: the Drus (Mont Blanc massif, France)

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In the past 15 years, large rock and rock/ice avalanches have occurred in high mountain areas worldwide (Mount Cook, 1991; Mount Fletcher, 1992; Kshwan Glacier, 1992; Mount Munday, 1997; Kolka-Karmadon, 2002). In the Alps, Brenva Glacier (1997), Punta Thurwieser (2004) and Monte Rosa east face (2005) are the most recent examples, while innumerable smaller rock falls have affected steep rock walls during the hot summer of 2003. During this period, the west face of the Drus (3733 m) in the Mont Blanc area (F) has repeatedly been affected by large rock falls, the main of which occurred in 1997, 2003 and 2005. As in the other cases, the Drus events are possibly related to permafrost changes induced by present global warming, which may destabilize oversteeepened rock walls in high mountain areas. We present first results of our investigations on the recent Drus rock fall activity, mainly the 2005 June event, that are based on direct observations, historical documents, ground-based LIDAR measurements and temperature modelling.