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New insight on the understanding of long runout avalanches: geometric lubrication E. LINARES, C. GOUJON, R. ZENIT, IIM-UNAM, Mexico — The unexpected long-runout landslides have been a controversial subject of discussion. In order to provide a new insight of this phenomena, we investigate the apparent reduction of friction resulting from the presence of small beads. Results obtained by means of a 2-D soft particle numerical simulation are presented. The numerical experiments consider an avalanche of two size disks, originally placed over an inclined plane. The friction coefficient for the particle-particle and wall-particle contacts is held fixed and is equal to 0.5. The granular mass is allowed to evolve with time, until it comes back to rest. The position of the center of mass is located, such that the runout length could be measured, L/H. Many simulations were performed keeping the area of the mass constant, varying only the percentage of small disks. The results show that the runout length increases with the percentage of small beads, reaching a maximum for approximately 25% of small disks. These results indicate that the apparent friction coefficient is reduced and affected by the percentage area of small particles. Additionally, the formation of a layer of small disks at the base of the avalanche was observed. This layer is identified as the source of "lubrication."

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