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Frontally confined versus frontally emergent submarine landslides: a 3D seismic characterisation

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2. Three-dimensional (3D) seismic data from the continental margin offshore Israel (Eastern Mediterranean) have been used to analyse the compressional structures within the toe regions of two major buried submarine landslides: the ISC and the T20. Both landslides are developed within a Plio-Pleistocene slope succession composed predominantly of claystones, limestones and siltstones. The high spatial resolution provided by the seismic data has allowed a detailed analysis of the geometries and deformational structures within the toe regions of the two landslides, and this has been used to develop a mechanical model for their development. Importantly, it has been recognised that submarine lanslides may be divided into two main types according to their form of frontal emplacement: *frontally confined* and *frontally emergent*. In the former, the landslide undergoes a resctricted downslope translation and does not overrun the undeformed downslope strata. In the latter, much larger downslope translation occurs because the landslide is able to ramp up from its original basal shear surface and translate in an unconfined manner over the seafloor. We propose that these two types of submarine landslides are end members of a continuum of gravity-driven slope failure processes, which extends from landslides where the headscarp is completely evacuated, to landslides where the material remanins entirely within the headscarp. The differentiation of these two end members is of critical importance as their respective mechanism of formation, downslope propagation and emplacement are significantly different, and hence need to be taken into consideration when analysing their respective kinematics.