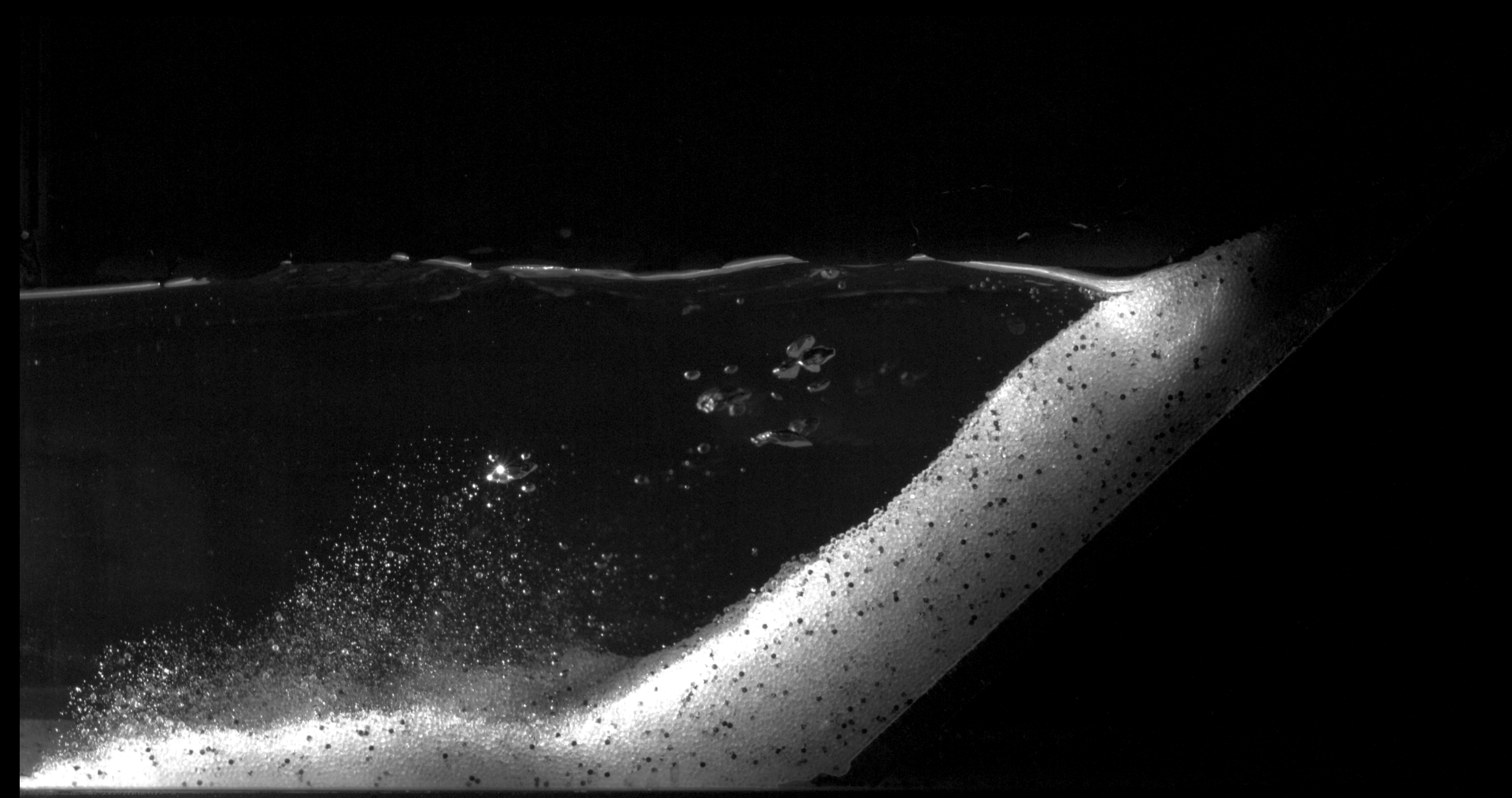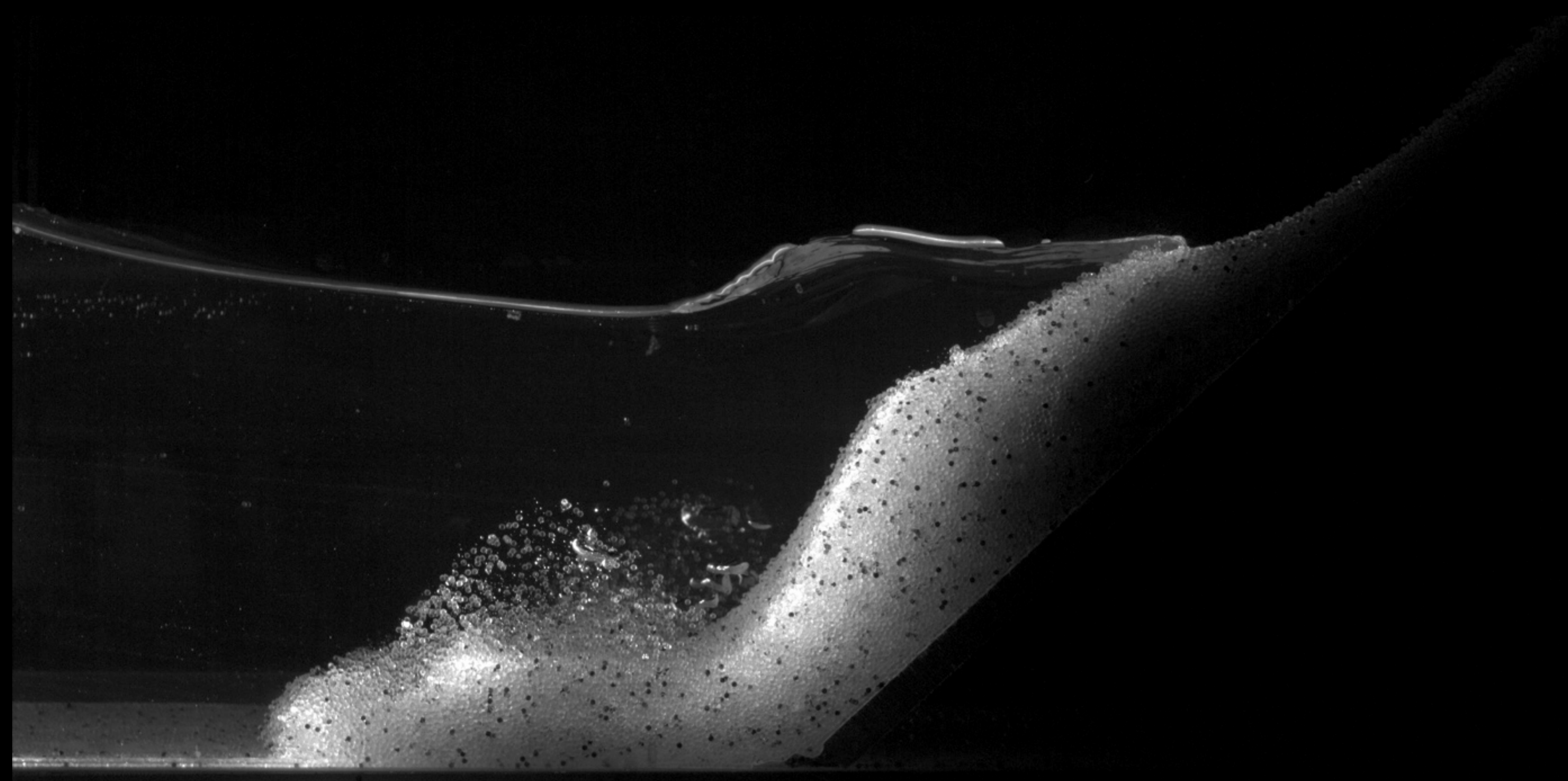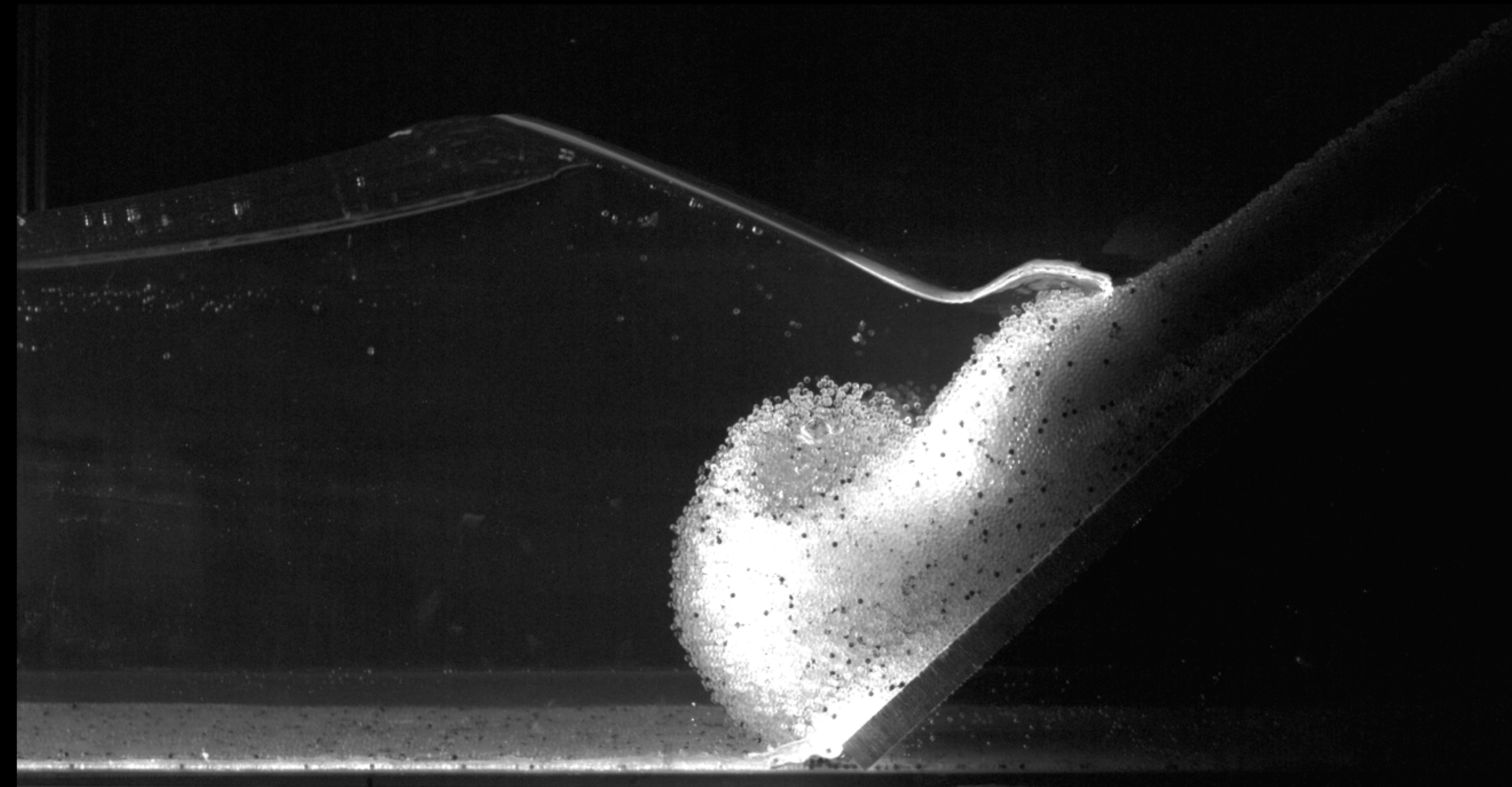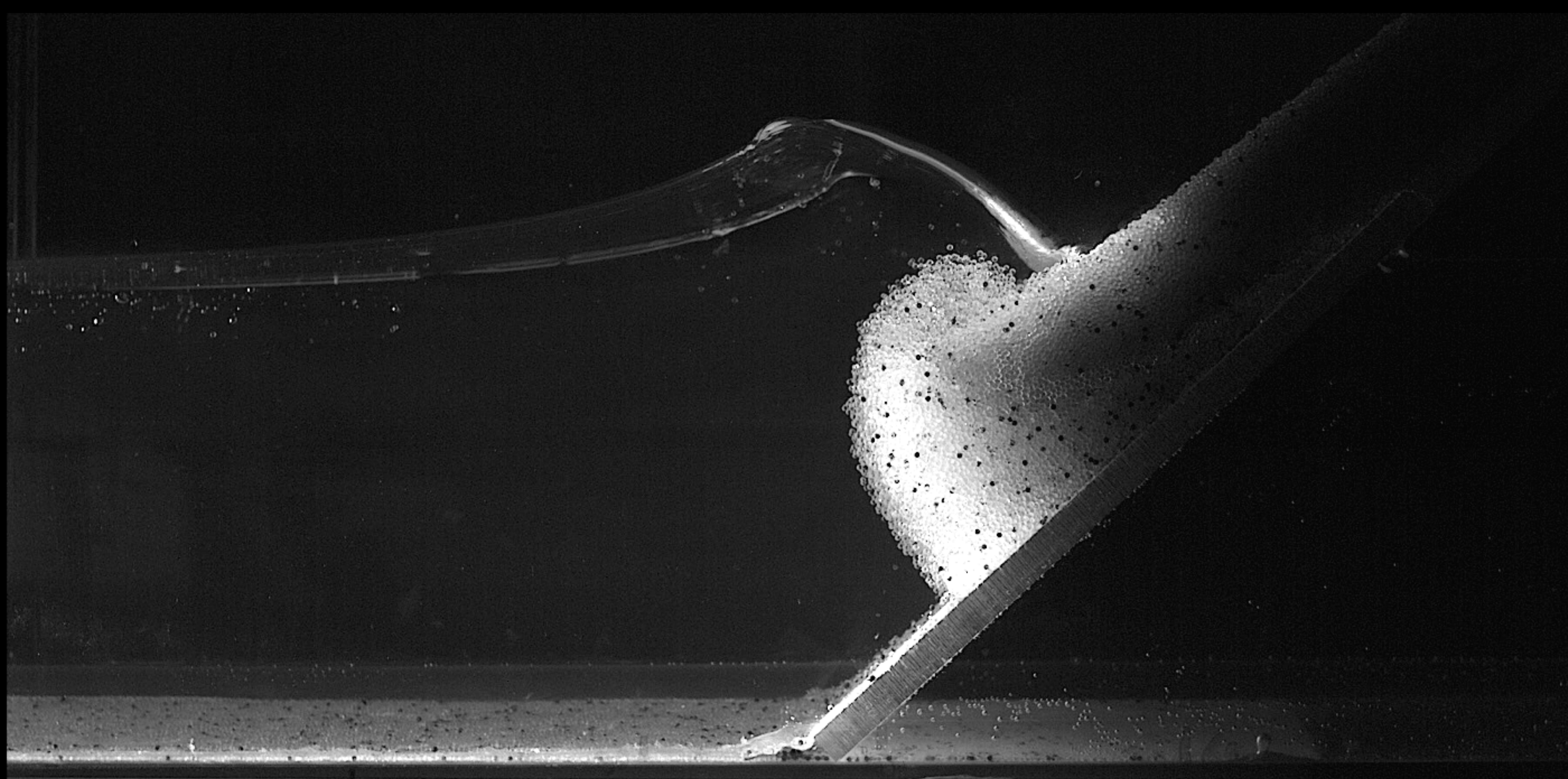# From dry to wet granular material

S. VIROULET[1], A. SAURET[2], O. KIMMOUN[3], C. KHARIF[3]

The generation of tsunamis arising from subaerial landslides is investigated using a model experimental setup. Our study shows the complexity of the interactions between the granular media, the water and the air captured.

Images taken at 0.2, 0.4, 0.6 and 1 sec after the onset of the collapse in 15 cm-deep water tank

Although many tsunamis arise from underwater earthquakes, some are induced by submarine and subaerial landslides. For example, the collapse of an unstable cliff into the sea can generate a tsunami wave near the coast that exhibits an extreme run-up. As a result, these tsunamis often result in a significant risk to the public: for instance, the Cap Canaille (400 m high) in the South of France (image on the right) is closely monitored. The threat caused by such tsunamis strongly depends on the topography and location of the unstable cliff. Predicting the height of the tsunami wave generated by a subaerial or submarine collapse requires experimental investigations, analytical modeling and numerical simulations.

We study the interactions between the dry granular collapse and the water that result in impulse waves in an 220 cm long aquarium tank. The dimensions of the tank allow the propagation of the waves and the observation of the interactions between the granular collapse and the generated waves. The surface elevation of the tsunami wave decreases as the distance to the power 1/3 whereas the amplitude of the wave just after the generation remains more complex.

1. School of Mathematics, University of Manchester, UK
2. SVI, UMR 125 CNRS/Saint-Gobain, France
3. IRPHE, UMR 7342 and Centrale Marseille, France

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