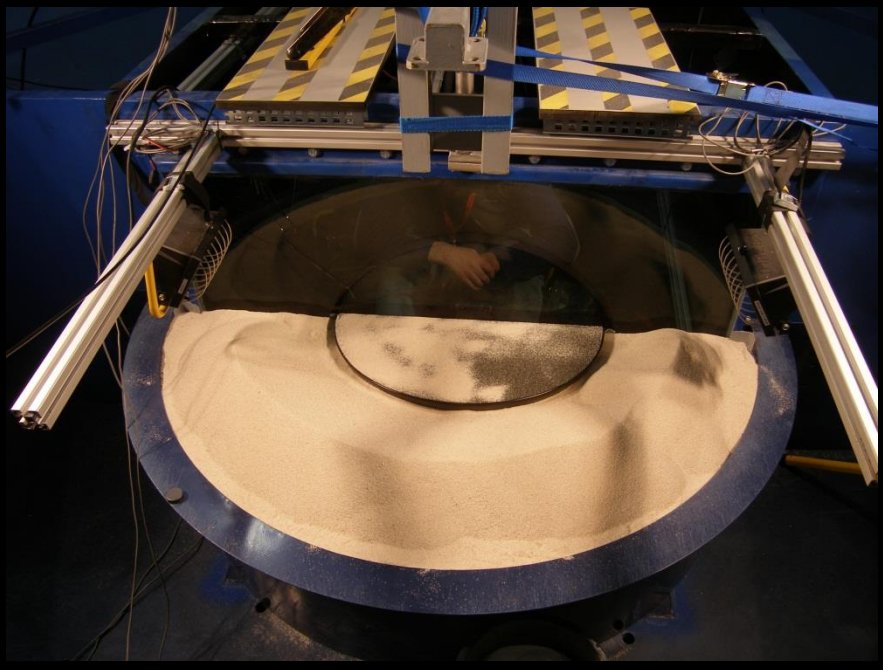
Experiments performed with the EPIC gun at CAB to investigate the effect of target material density differences at impacts into layered targets.

Upper layer: beach sand (1.1795 g/cm3)
Substrate: iron grit sand (4.44 g/cm3)



For detailed results see separate manuscript tables

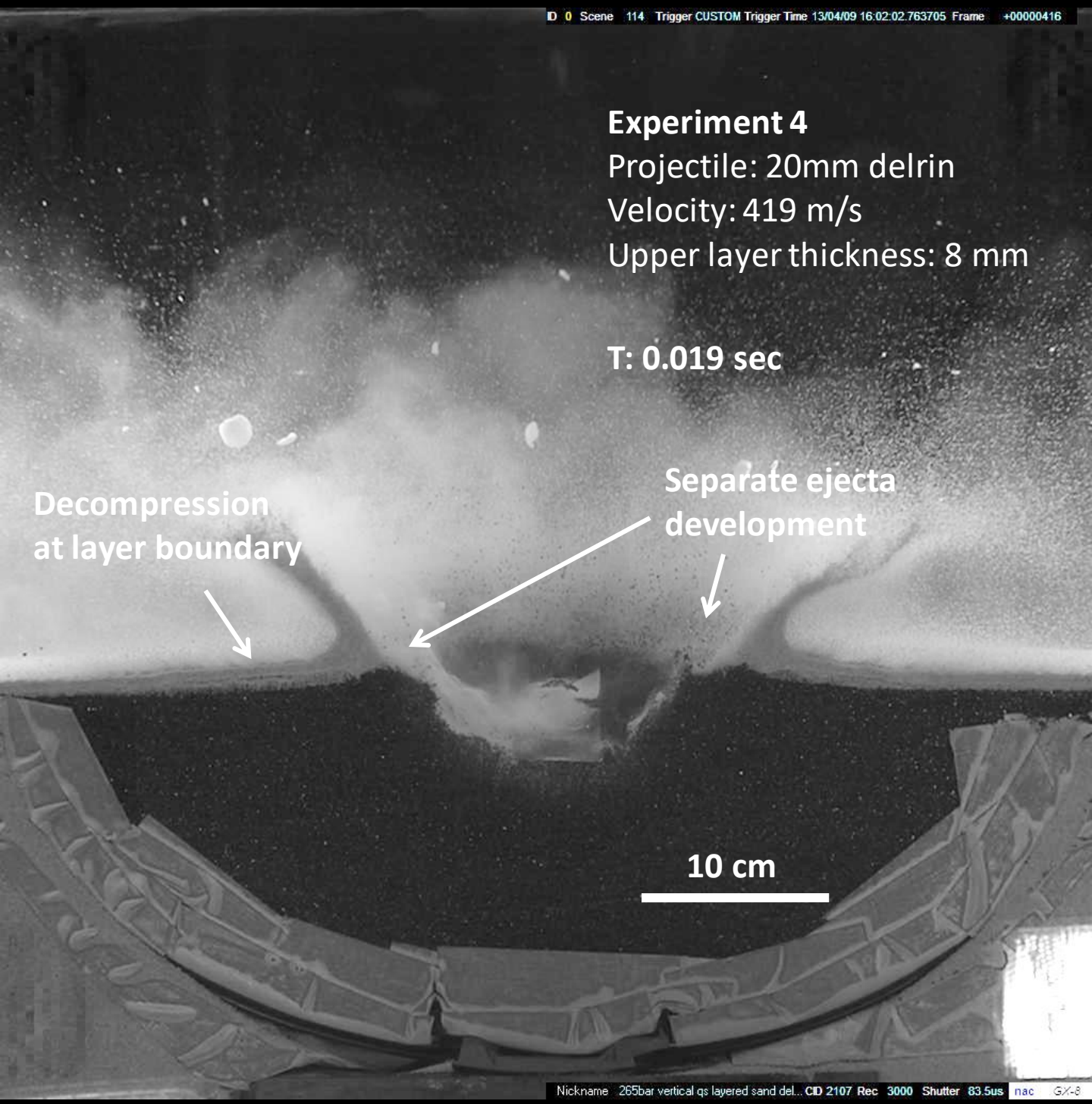
Experiment 3 (Reference shot)
Projectile: 20mm delrin
Velocity: 414 m/s
Target only iron grit sand

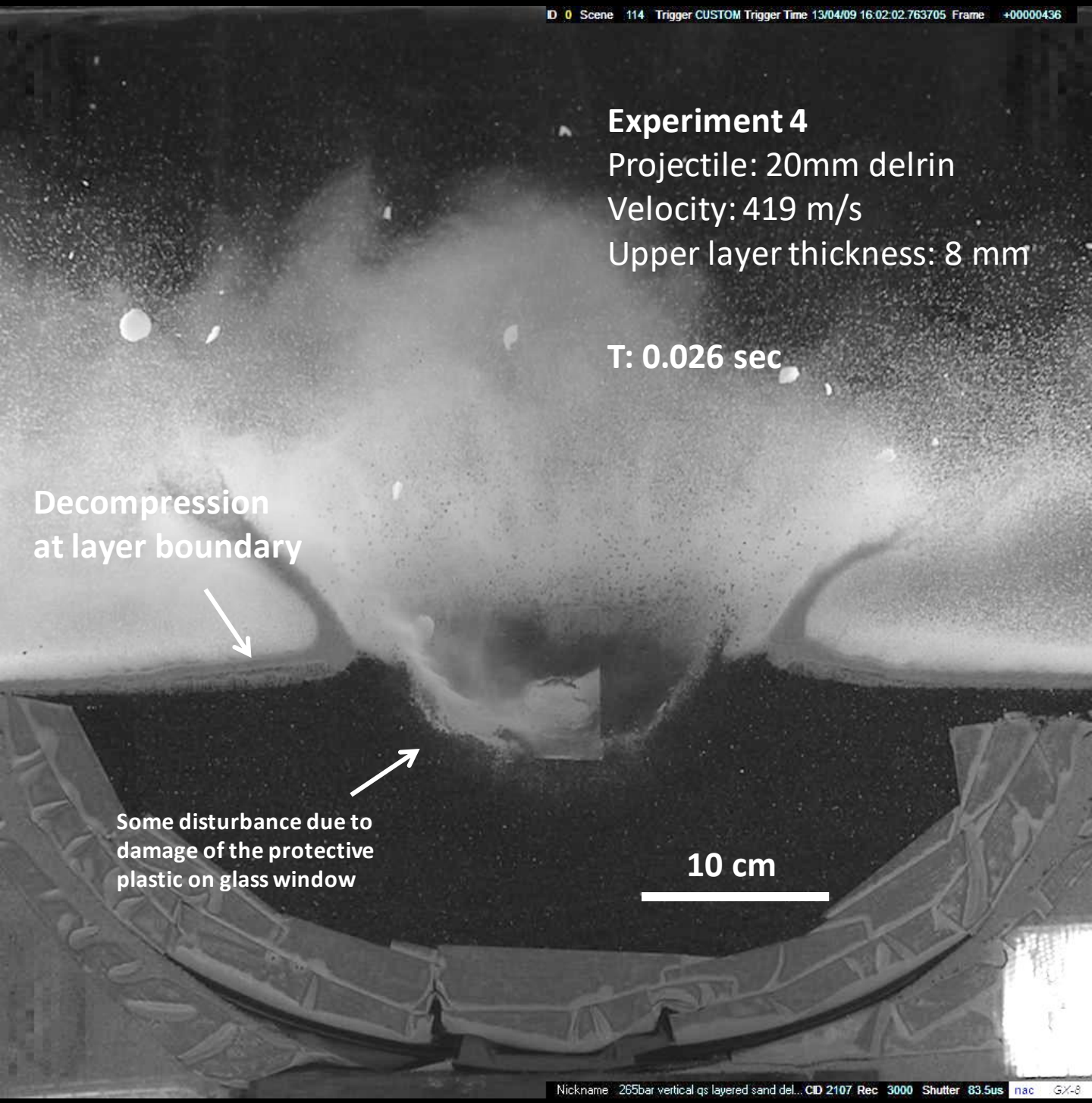
Final crater

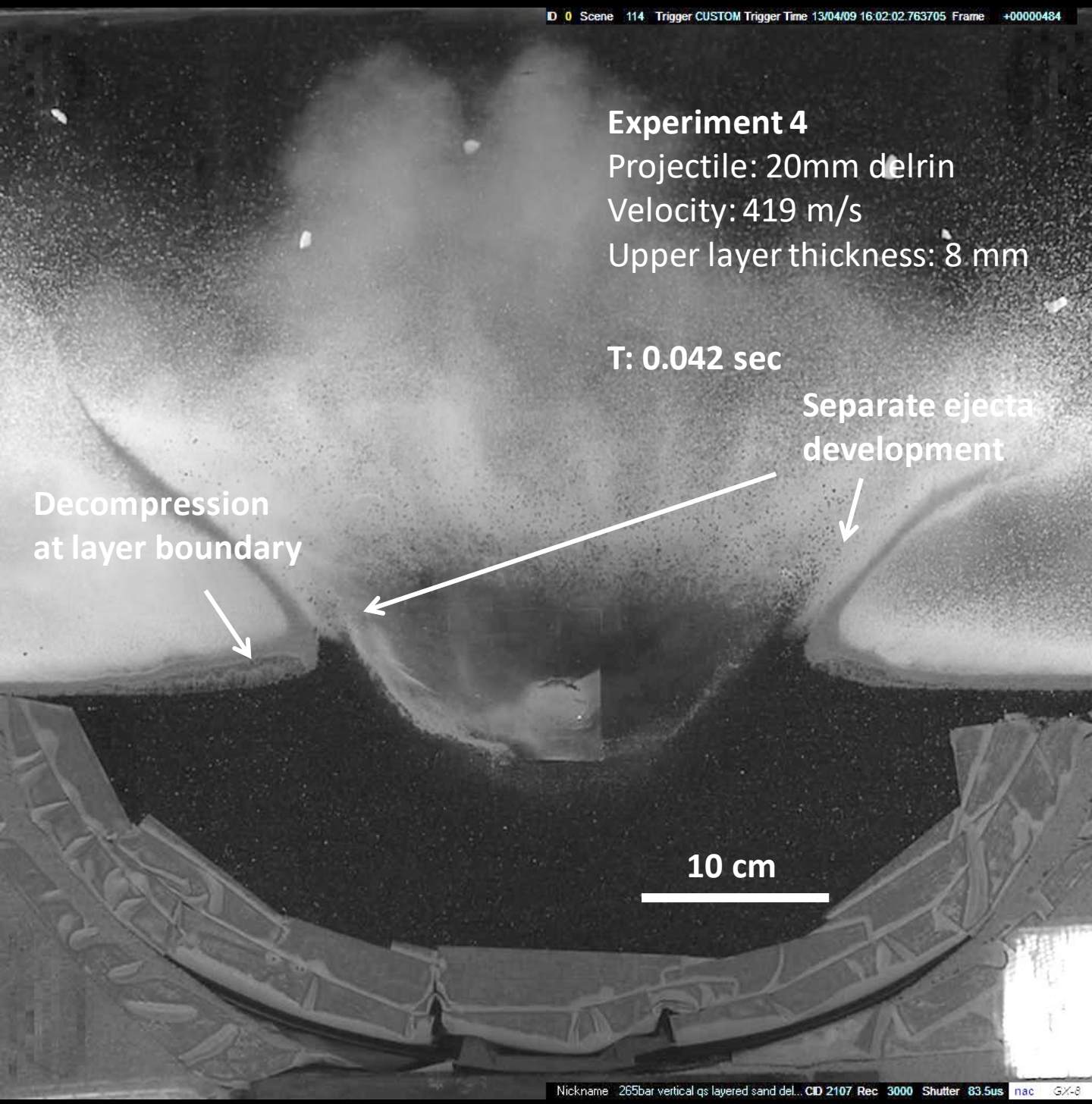
Experiment 4
Projectile: 20mm delrin
Velocity: 419 m/s
Upper layer thickness: 8 mm

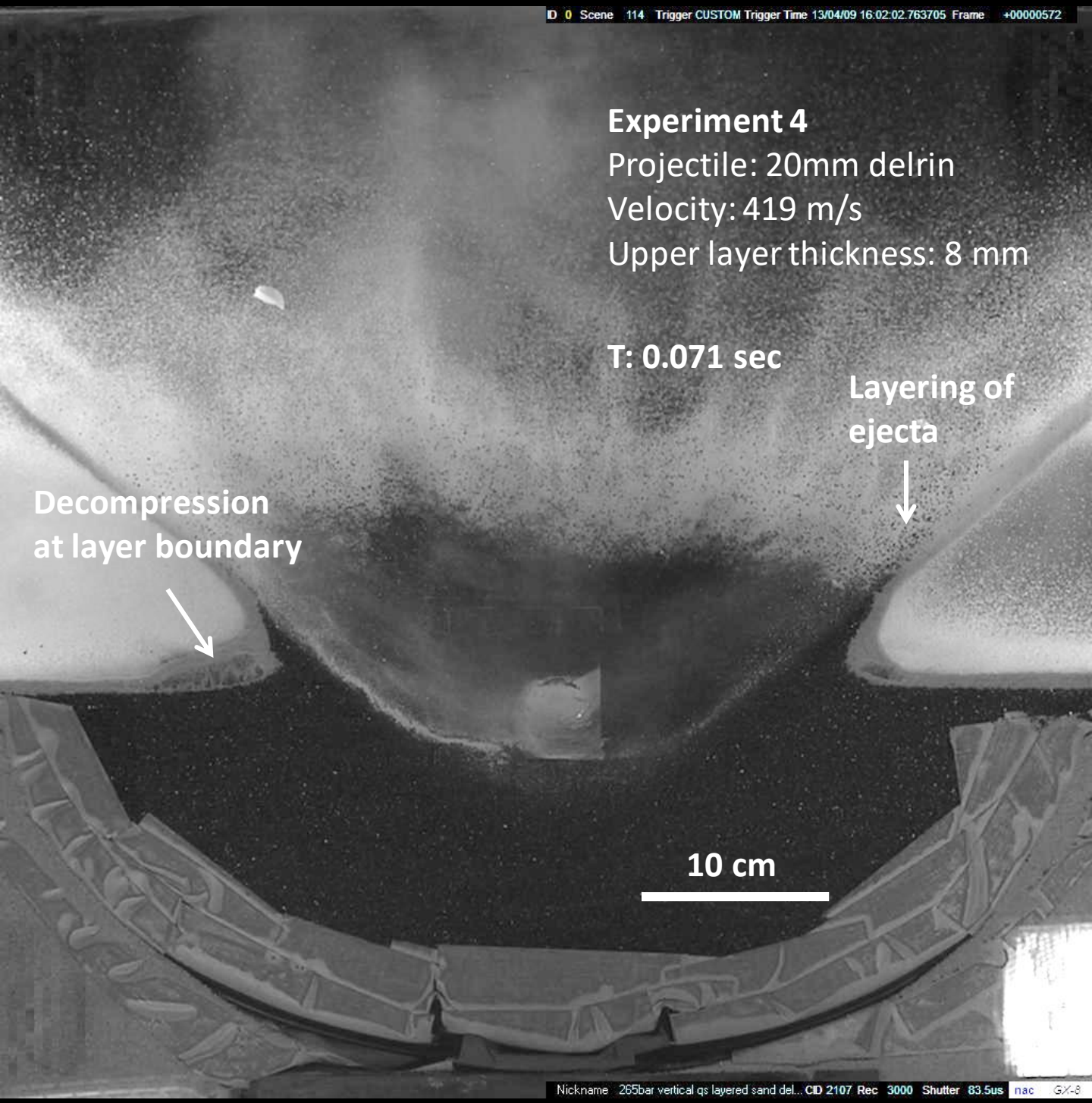
T: 0 sec

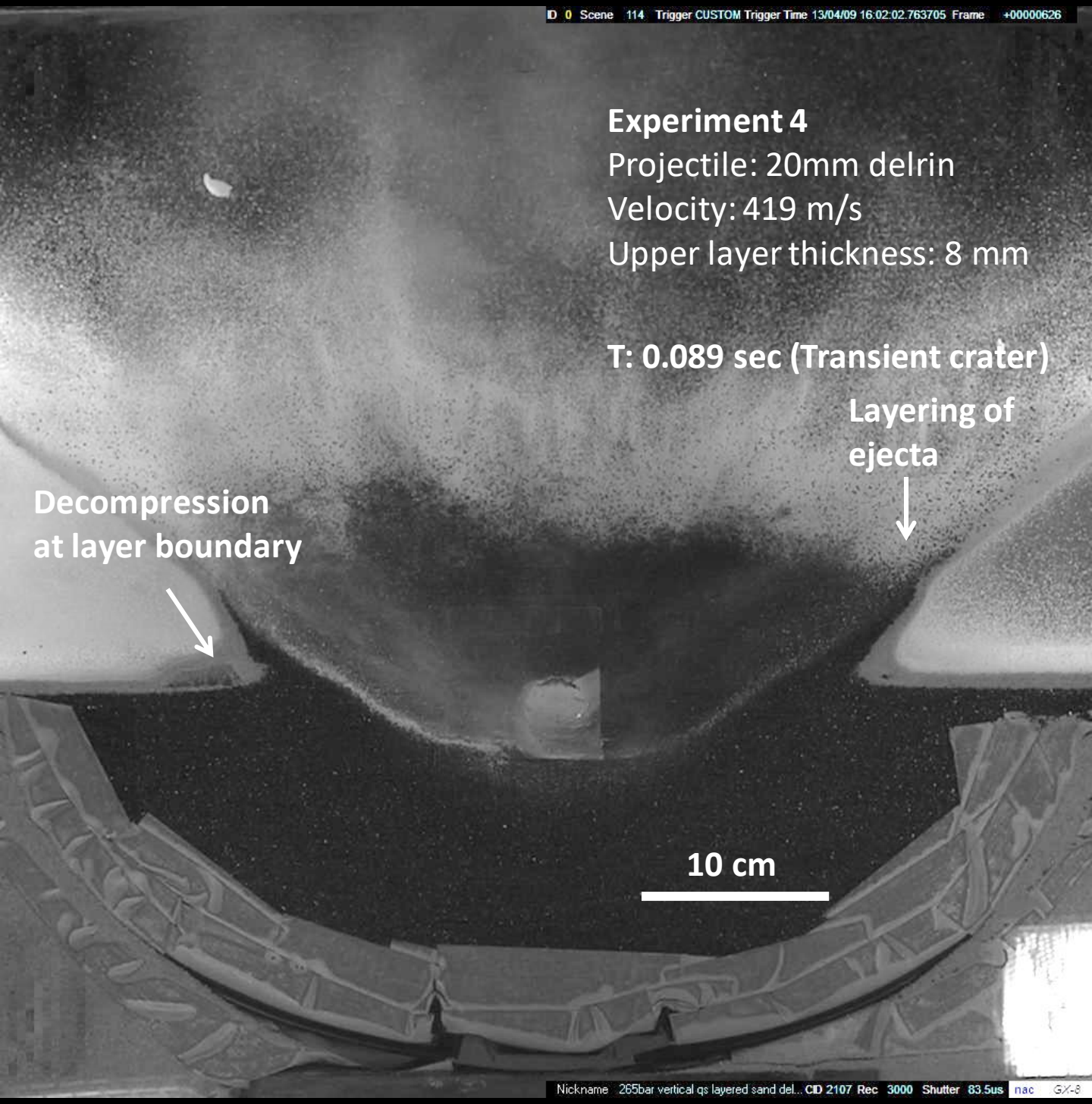
10 cm

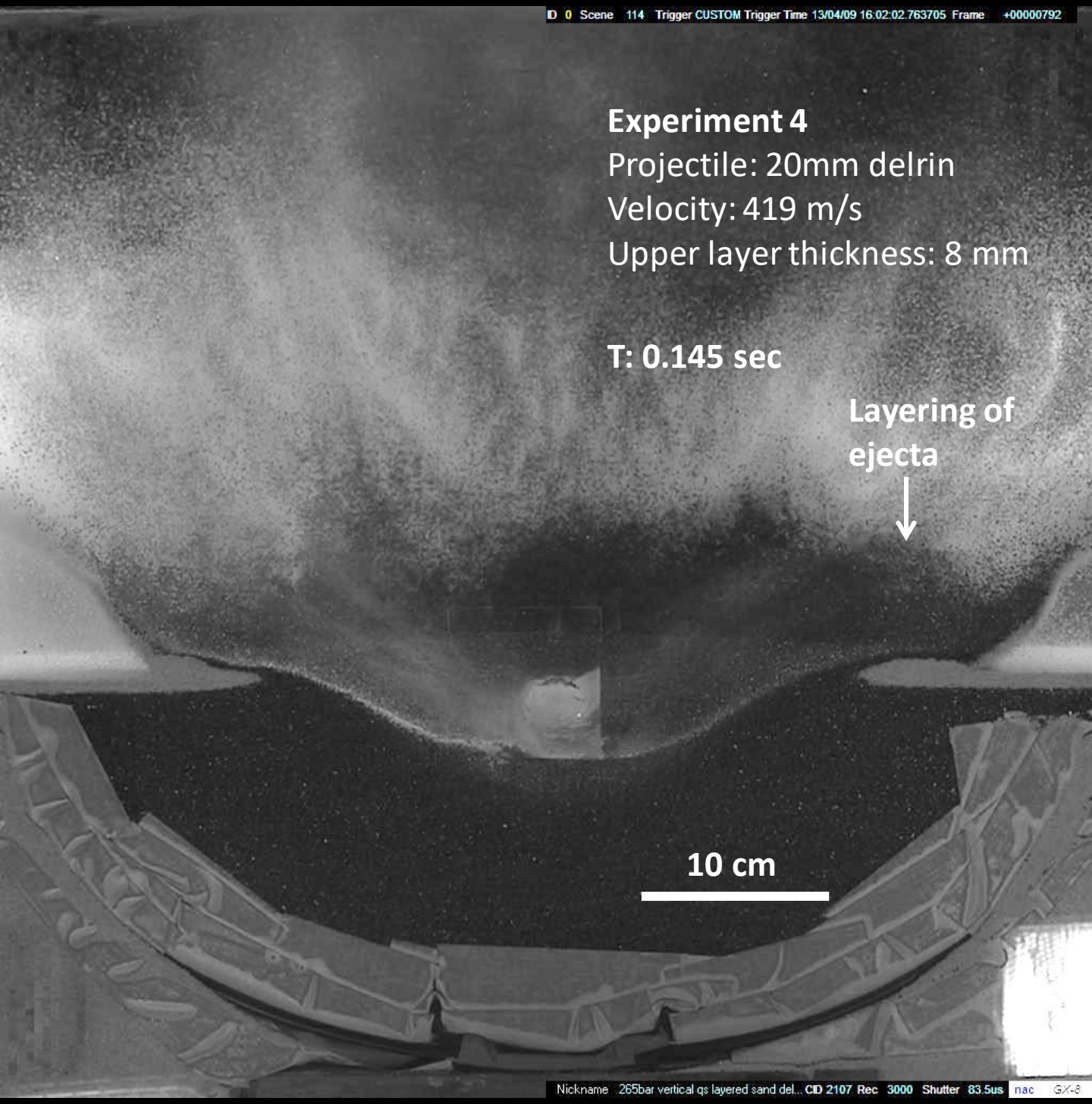

ID 0 Scene 114 Trigger CUSTOM Trigger Time 13/04/09 16:02:02.763705 Frame +00000416
Experiment 4
Projectile: 20mm delrin
Velocity: 419 m/s
Upper layer thickness: 8 mm
T: 0.019 sec
Decompression at layer boundary
Separate ejecta development
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

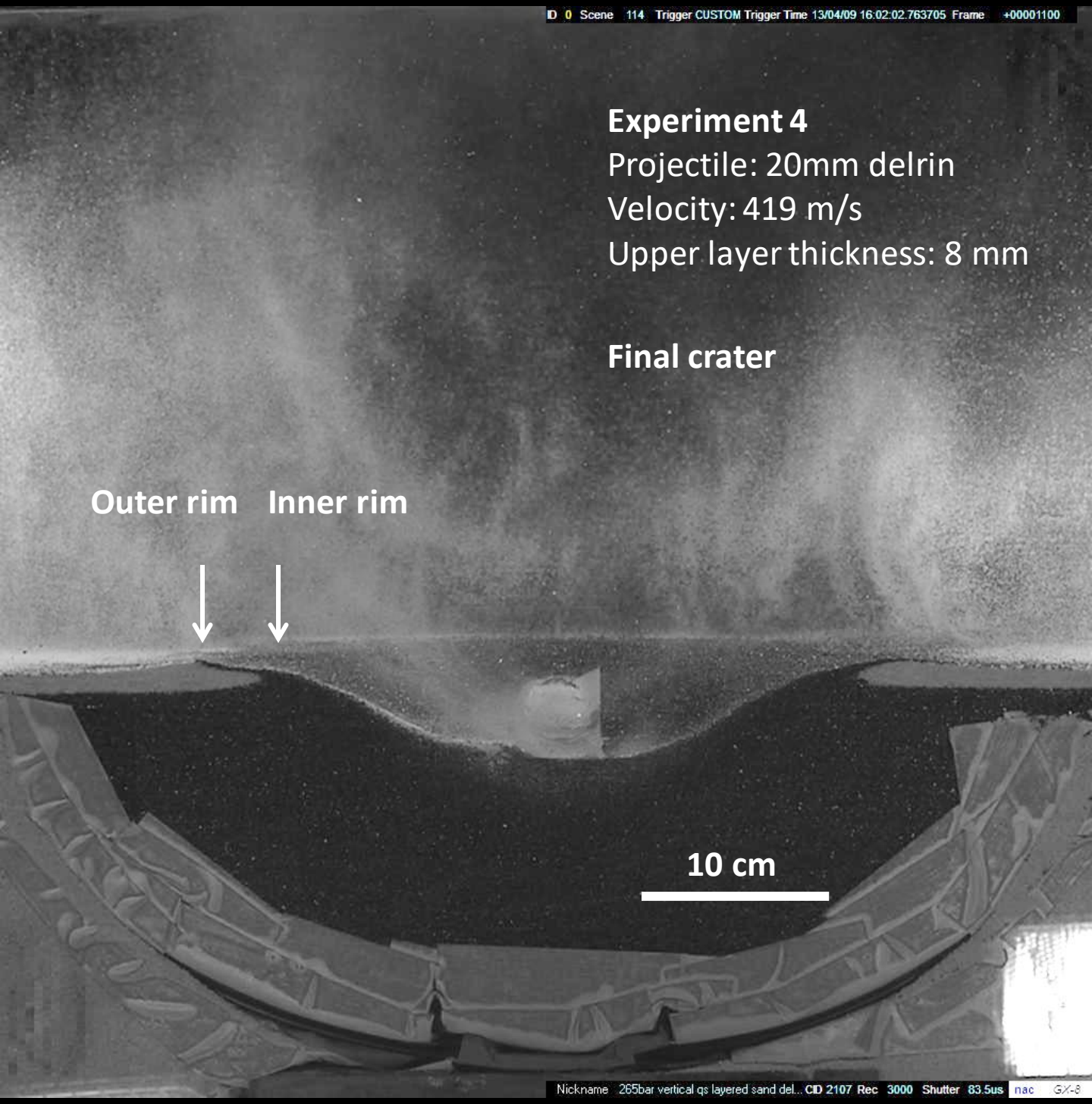

ID 0 Scene 114 Trigger CUSTOM Trigger Time 13/04/09 16:02:02.763705 Frame +00000436
Experiment 4
Projectile: 20mm delrin
Velocity: 419 m/s
Upper layer thickness: 8 mm
T: 0.026 sec
Decompression at layer boundary
Some disturbance due to damage of the protective plastic on glass window
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

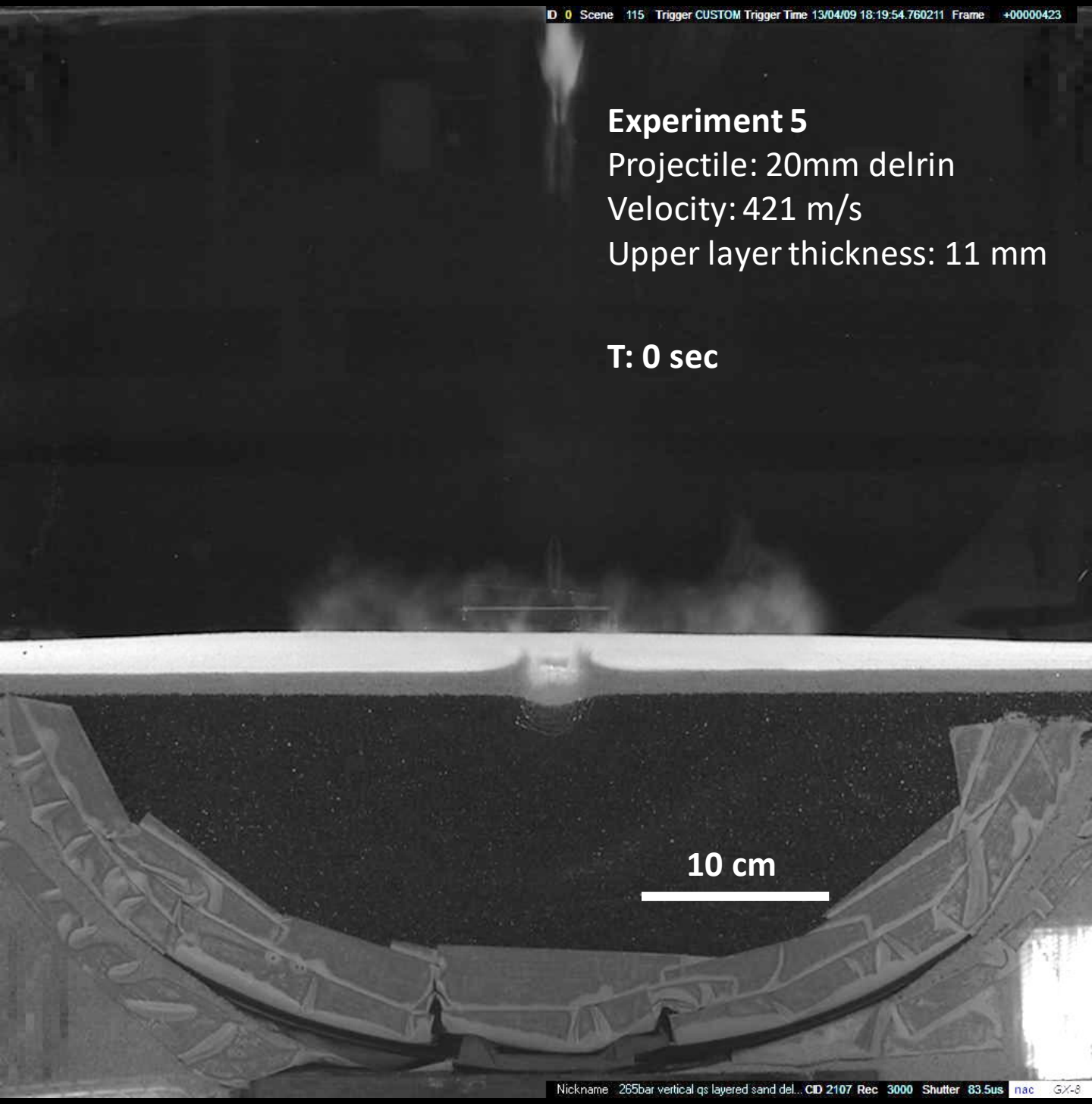

ID 0 Scene 114 Trigger CUSTOM Trigger Time 13/04/09 16:02:02.763705 Frame +00000484
Experiment 4
Projectile: 20mm delrin
Velocity: 419 m/s
Upper layer thickness: 8 mm
T: 0.042 sec
Separate ejecta development
Decompression at layer boundary
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

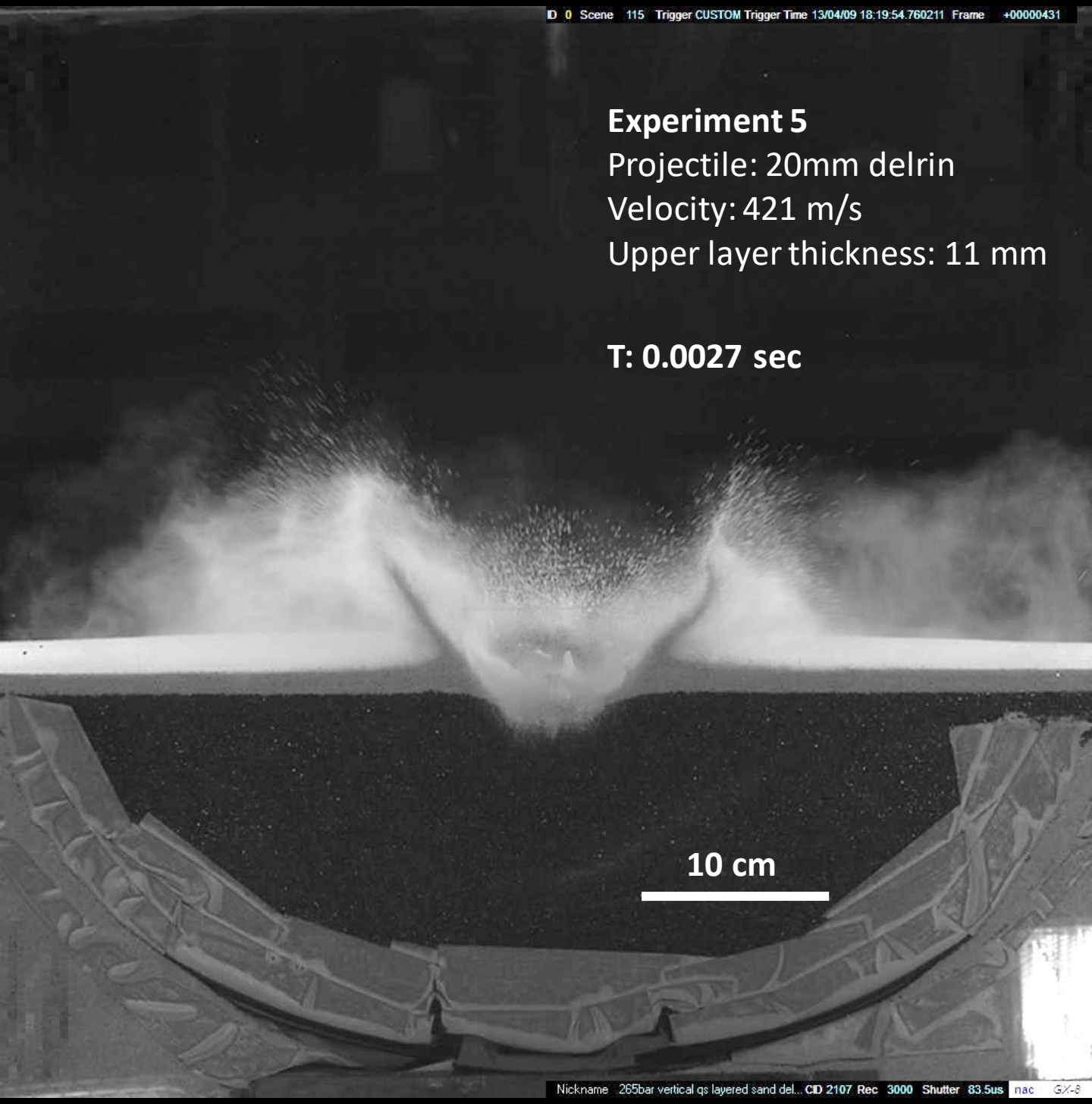

ID 0 Scene 114 Trigger CUSTOM Trigger Time 13/04/09 16:02:02.763705 Frame +00000572
Experiment 4
Projectile: 20mm delrin
Velocity: 419 m/s
Upper layer thickness: 8 mm
T: 0.071 sec
Layering of ejecta
Decompression at layer boundary
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

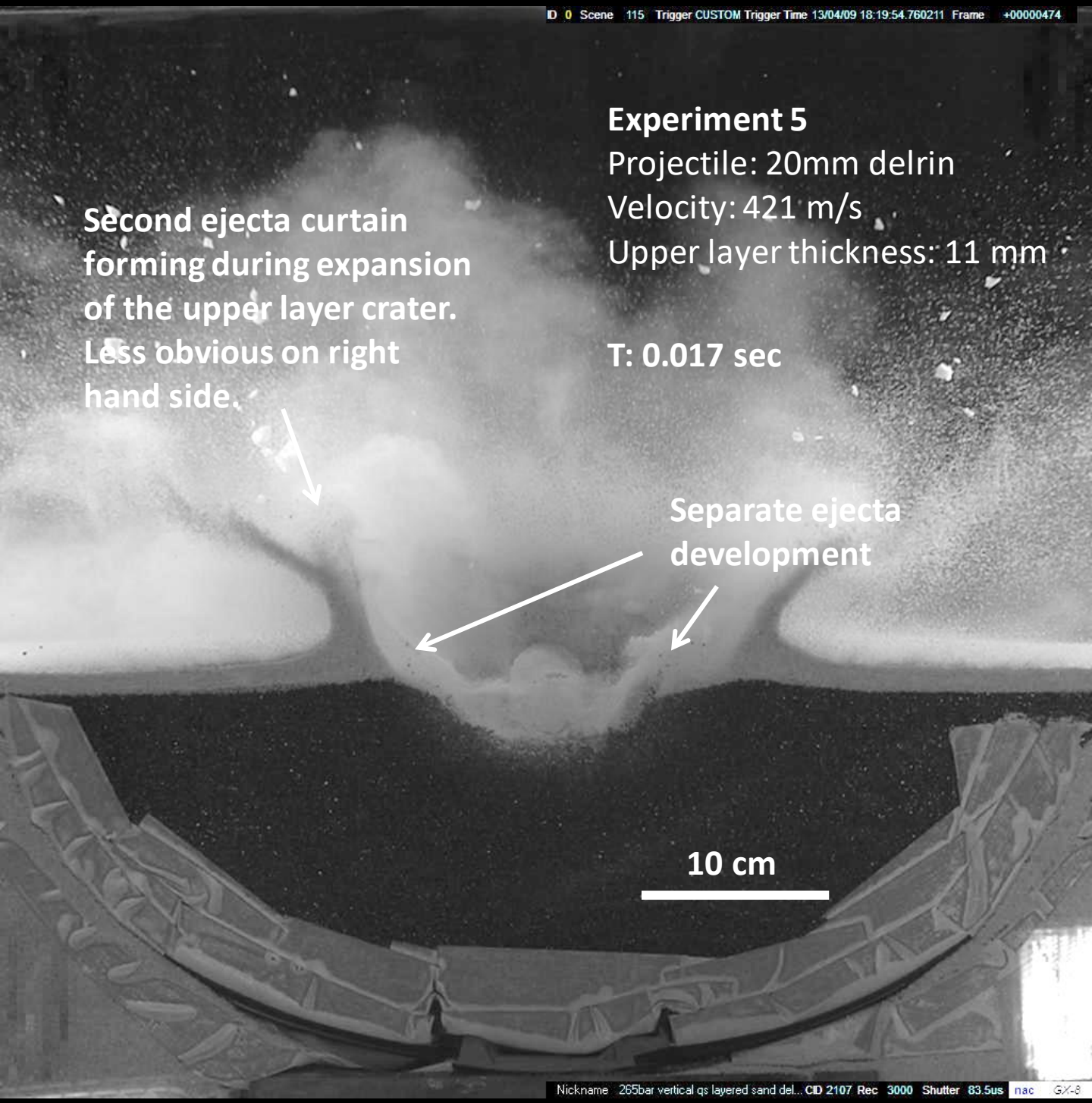

ID 0 Scene 114 Trigger CUSTOM Trigger Time 13/04/09 16:02:02.763705 Frame +00000626
Experiment 4
Projectile: 20mm delrin
Velocity: 419 m/s
Upper layer thickness: 8 mm
T: 0.089 sec (Transient crater)
Layering of ejecta
Decompression at layer boundary
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

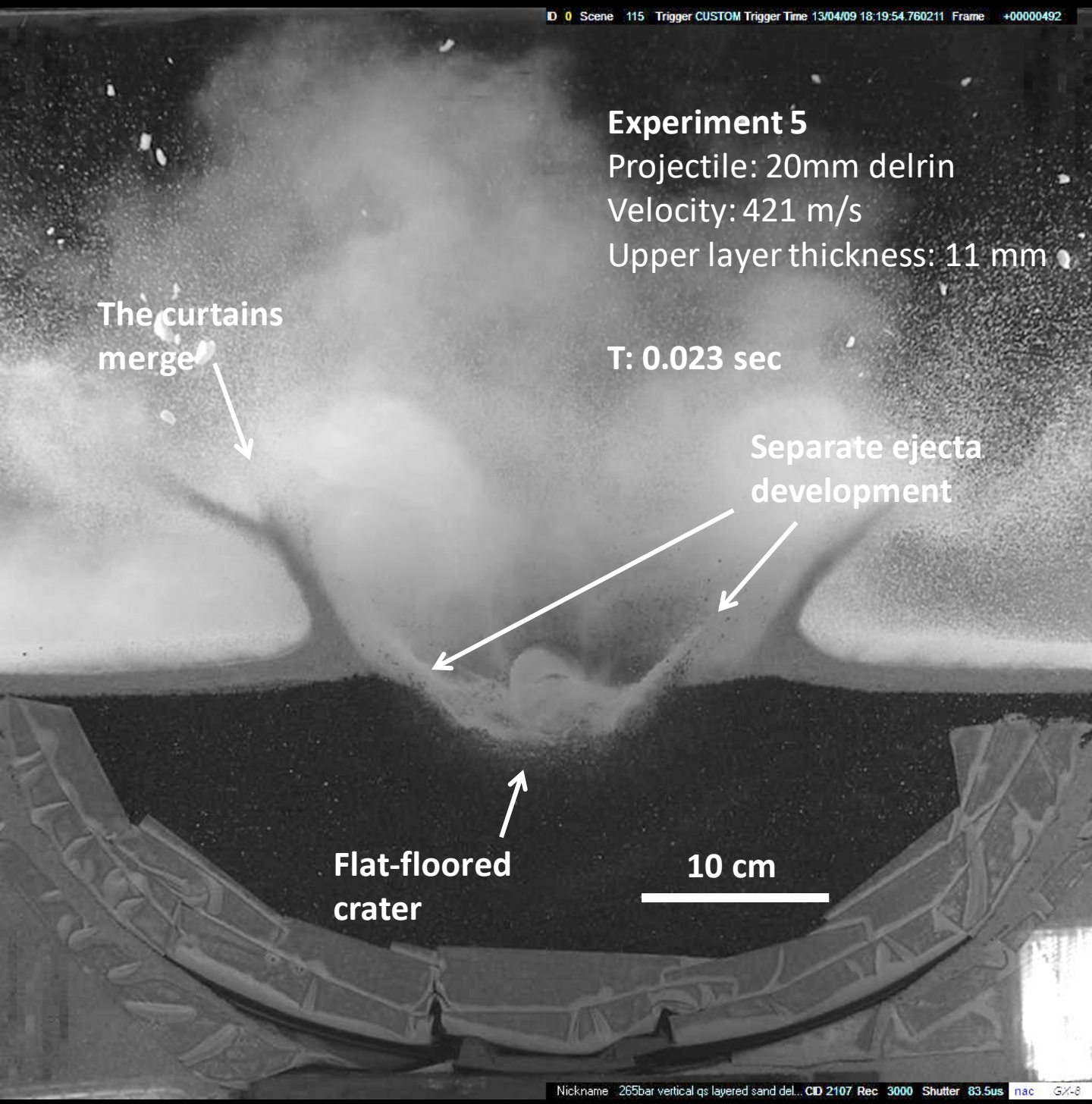

ID 0 Scene 114 Trigger CUSTOM Trigger Time 13/04/09 16:02:02.763705 Frame +00000792
Experiment 4
Projectile: 20mm delrin
Velocity: 419 m/s
Upper layer thickness: 8 mm
T: 0.145 sec
Layering of ejecta
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

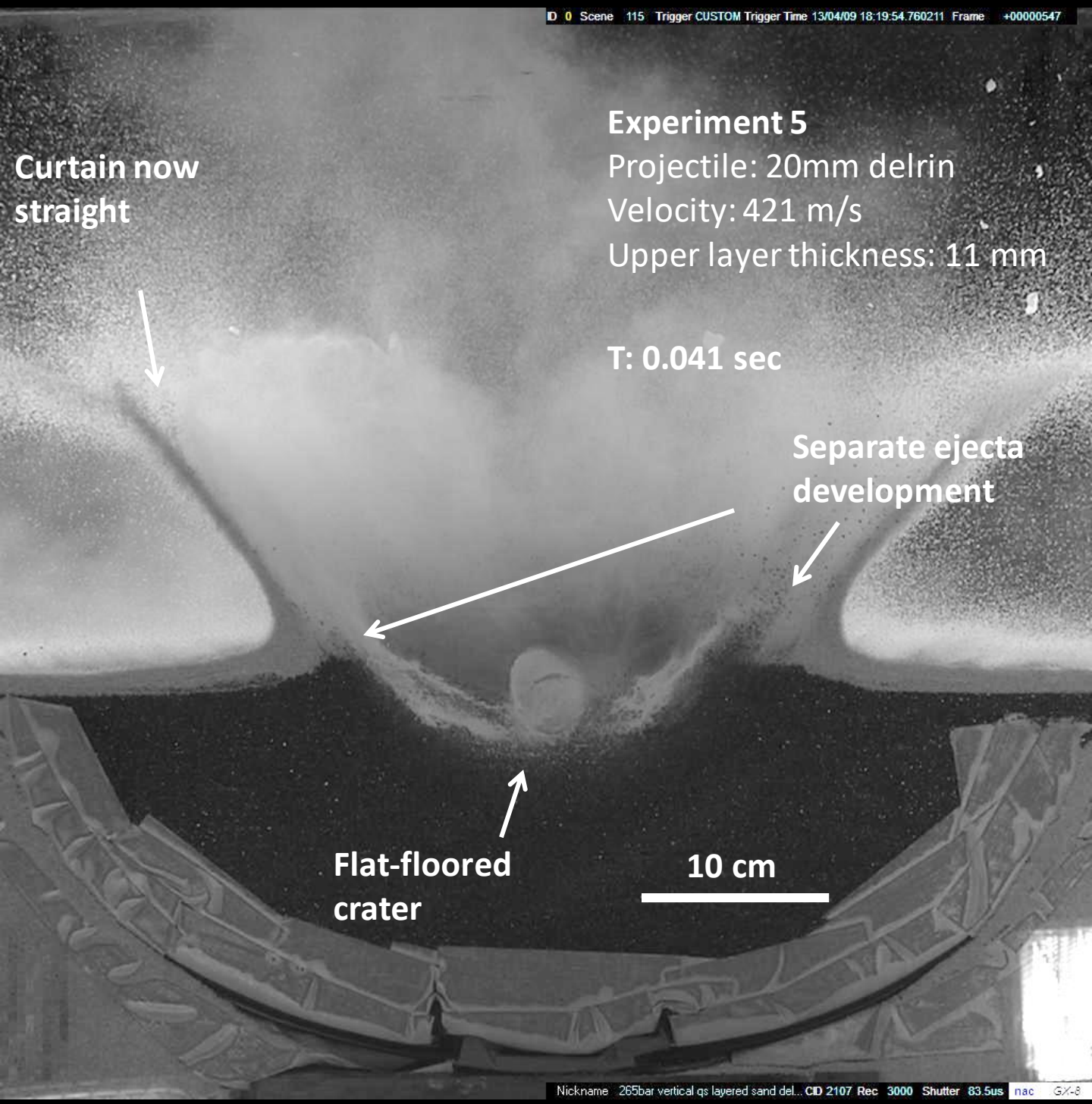

ID 0 Scene 114 Trigger CUSTOM Trigger Time 13/04/09 16:02:02.763705 Frame +00001100
Experiment 4
Projectile: 20mm delrin
Velocity: 419 m/s
Upper layer thickness: 8 mm
Final crater
Outer rim
Inner rim
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

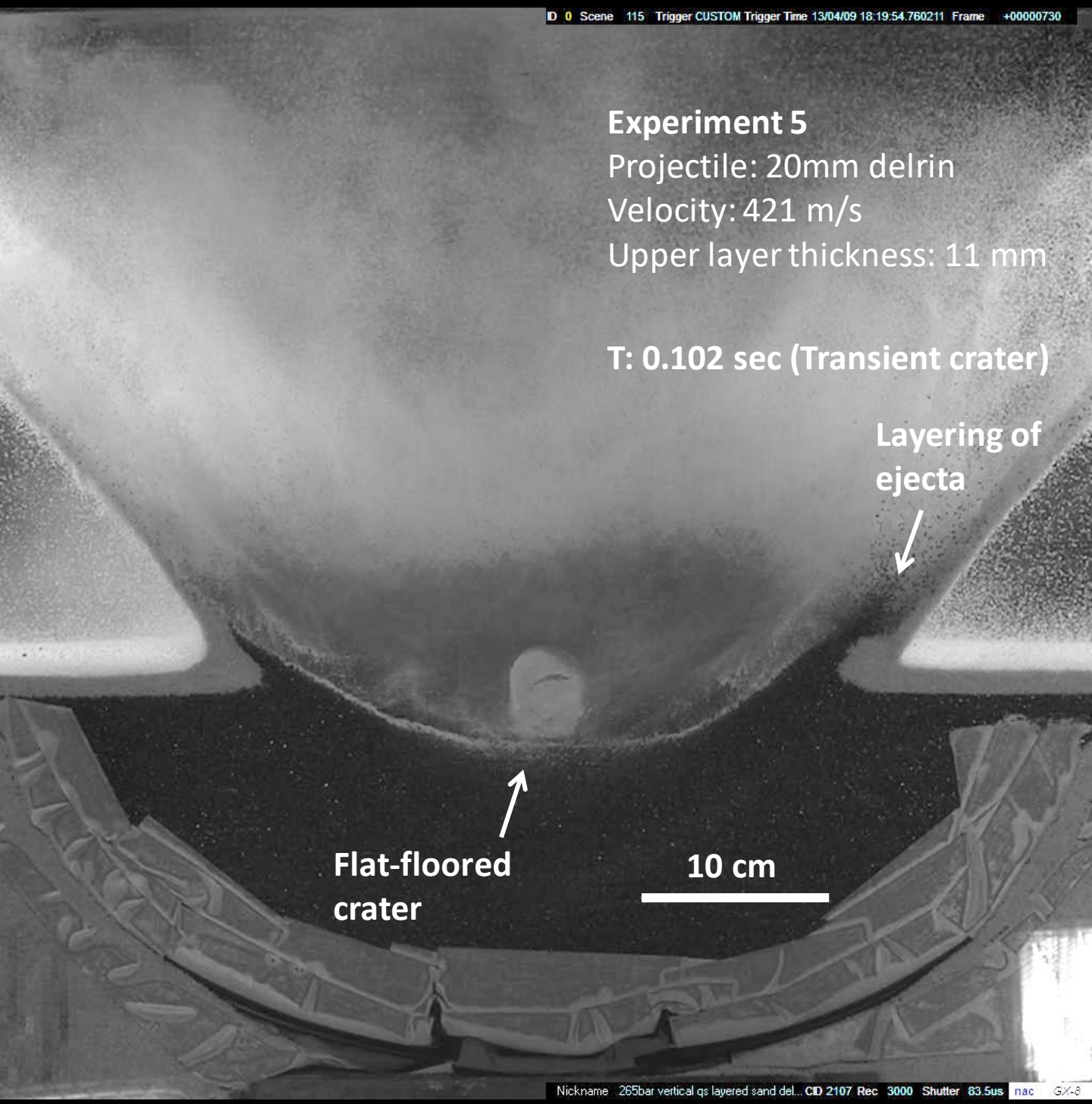

ID 0 Scene 115 Trigger CUSTOM Trigger Time 13/04/09 18:19:54.760211 Frame +00000423
Experiment 5
Projectile: 20mm delrin
Velocity: 421 m/s
Upper layer thickness: 11 mm
T: 0 sec
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

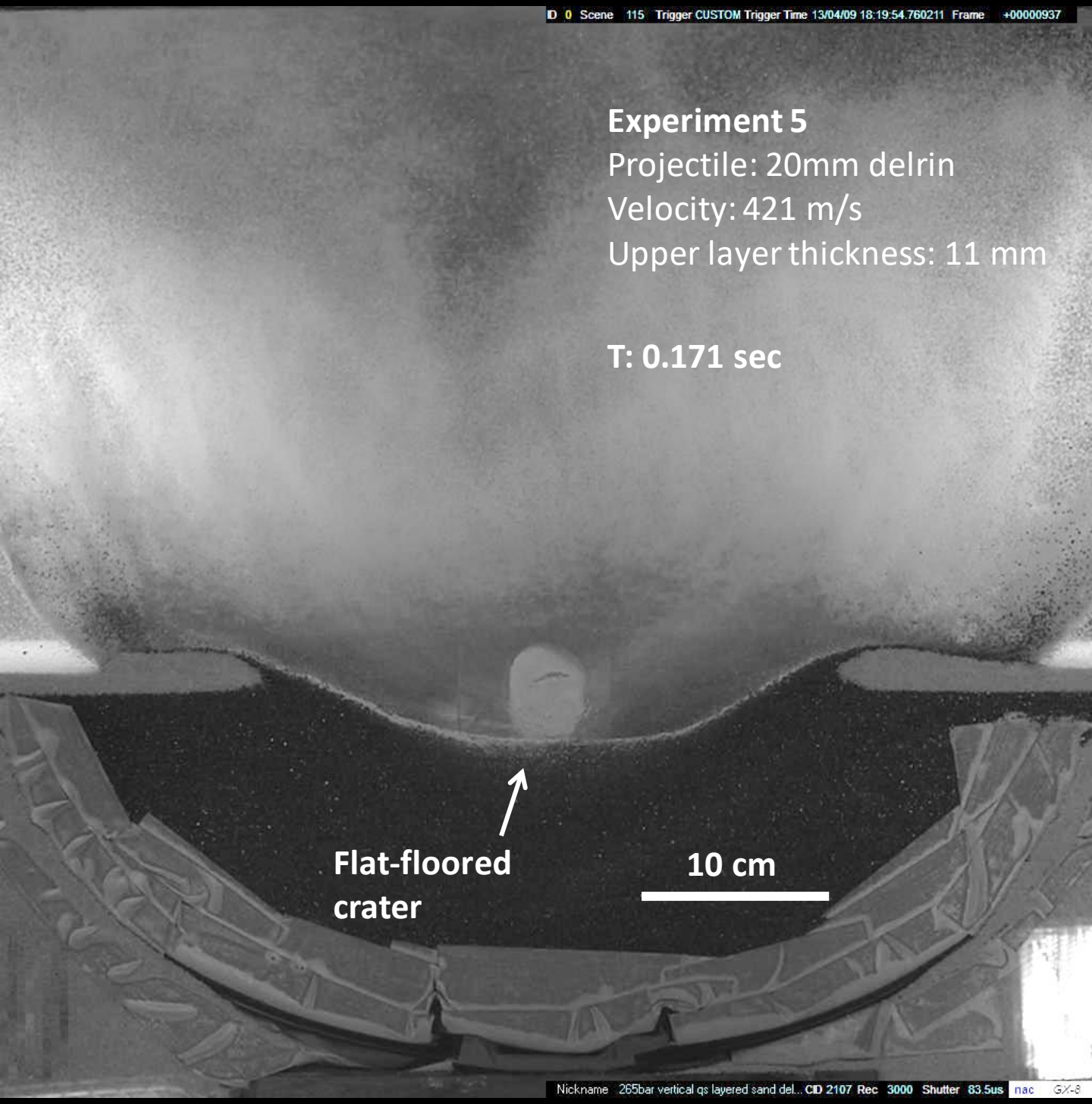

ID 0 Scene 115 Trigger CUSTOM Trigger Time 13/04/09 18:19:54.760211 Frame +00000431
Experiment 5
Projectile: 20mm delrin
Velocity: 421 m/s
Upper layer thickness: 11 mm
T: 0.0027 sec
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

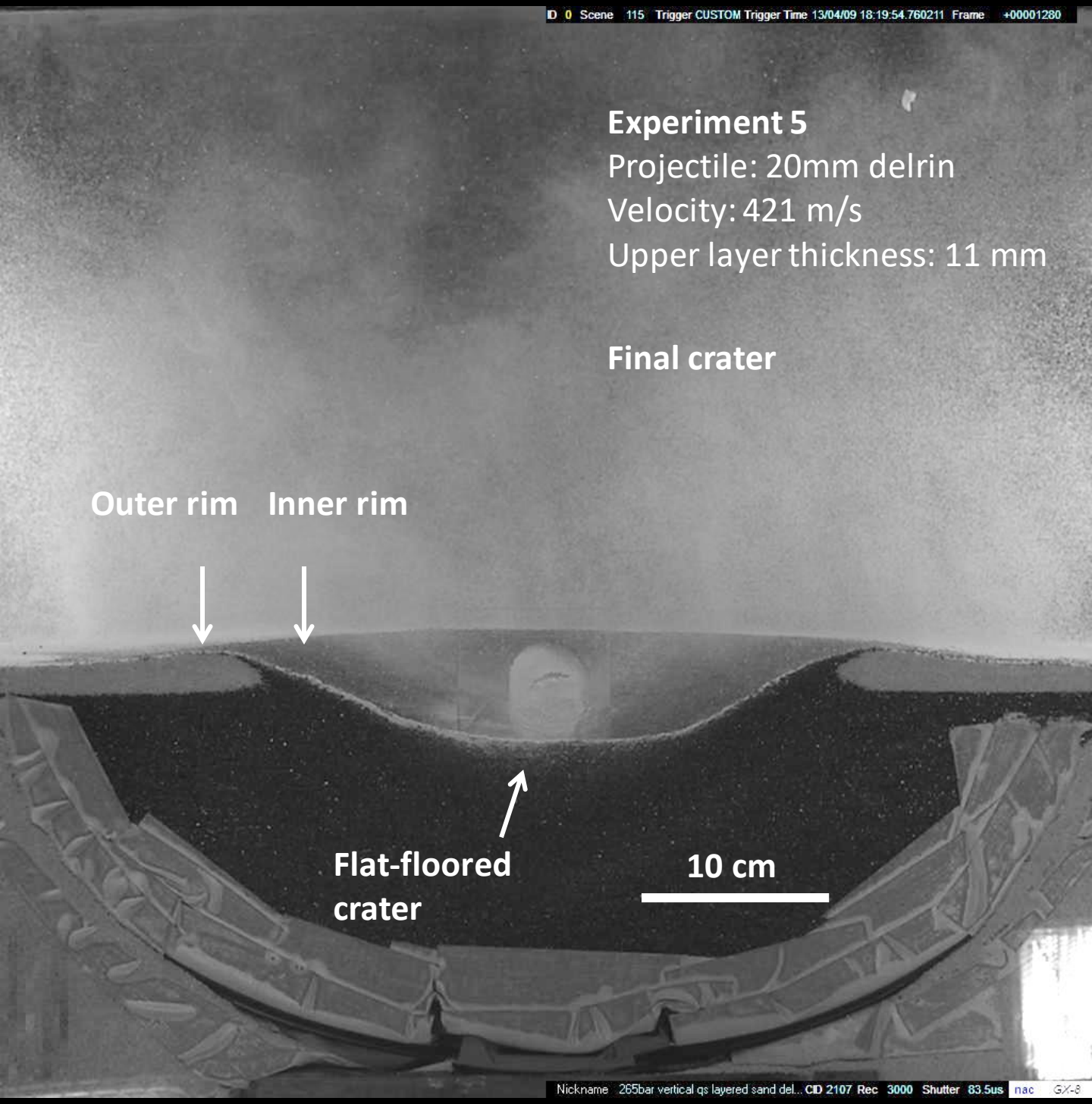

ID 0 Scene 115 Trigger CUSTOM Trigger Time 13/04/09 18:19:54.760211 Frame +00000474
Experiment 5
Projectile: 20mm delrin
Velocity: 421 m/s
Upper layer thickness: 11 mm
T: 0.017 sec
Second ejecta curtain forming during expansion of the upper layer crater. Less obvious on right hand side.
Separate ejecta development
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

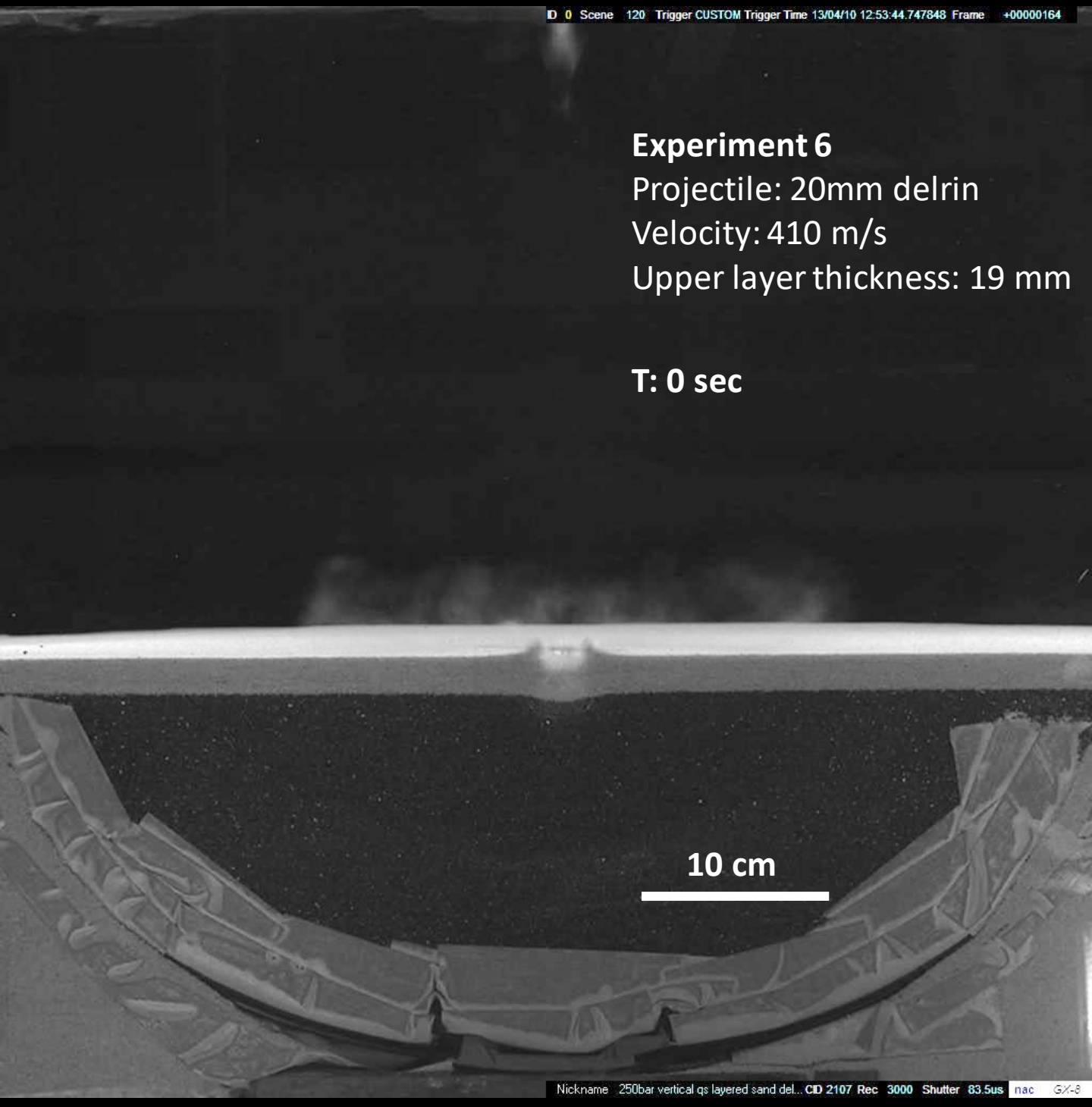

ID 0 Scene 115 Trigger CUSTOM Trigger Time 13/04/09 18:19:54.760211 Frame +00000492
Experiment 5
Projectile: 20mm delrin
Velocity: 421 m/s
Upper layer thickness: 11 mm
T: 0.023 sec
The curtains merge
Separate ejecta development
Flat-floored crater
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

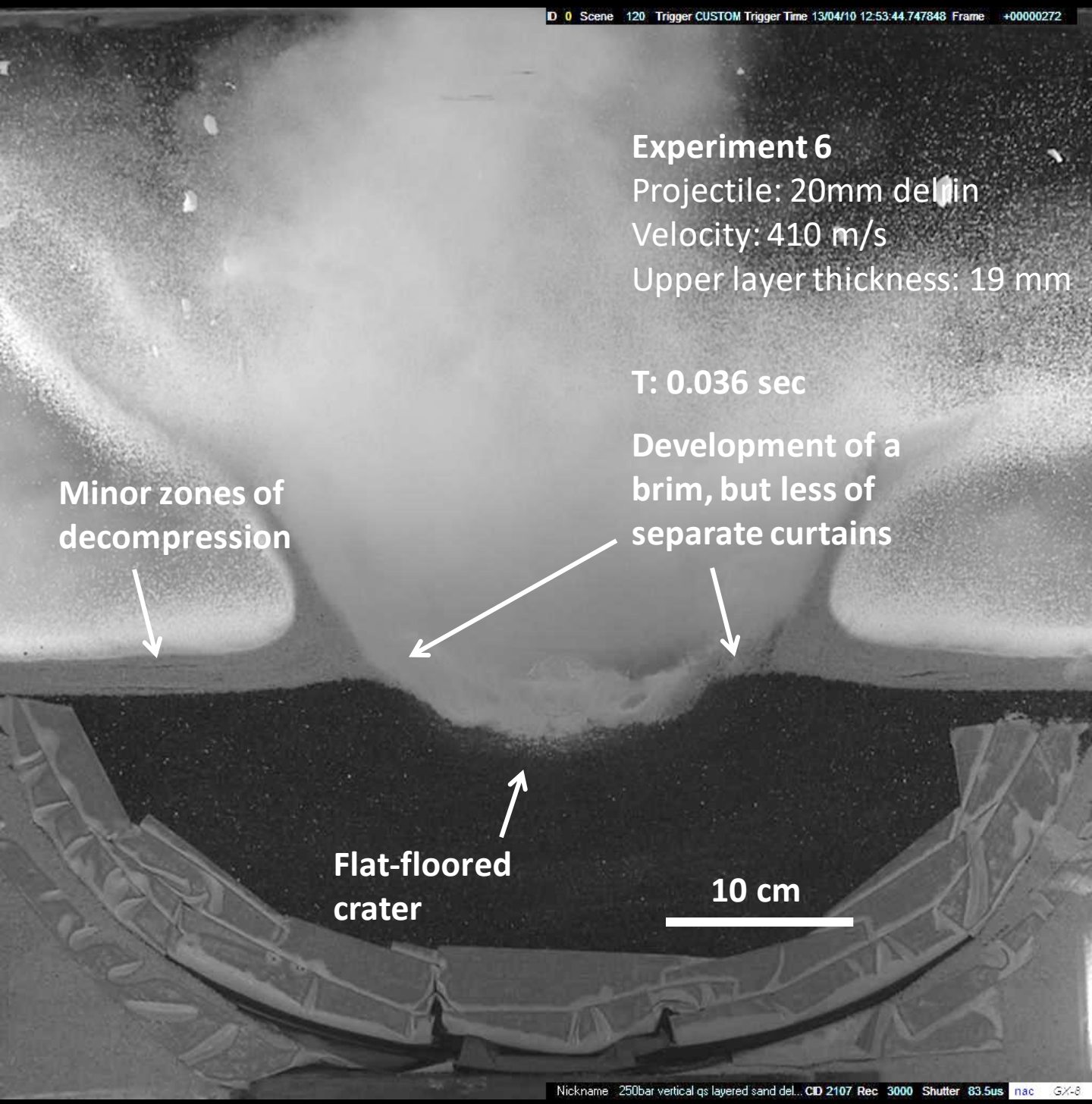

ID 0 Scene 115 Trigger CUSTOM Trigger Time 13/04/09 18:19:54.760211 Frame +00000547
Curtain now straight
Experiment 5
Projectile: 20mm delrin
Velocity: 421 m/s
Upper layer thickness: 11 mm
T: 0.041 sec
Separate ejecta development
Flat-floored crater
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

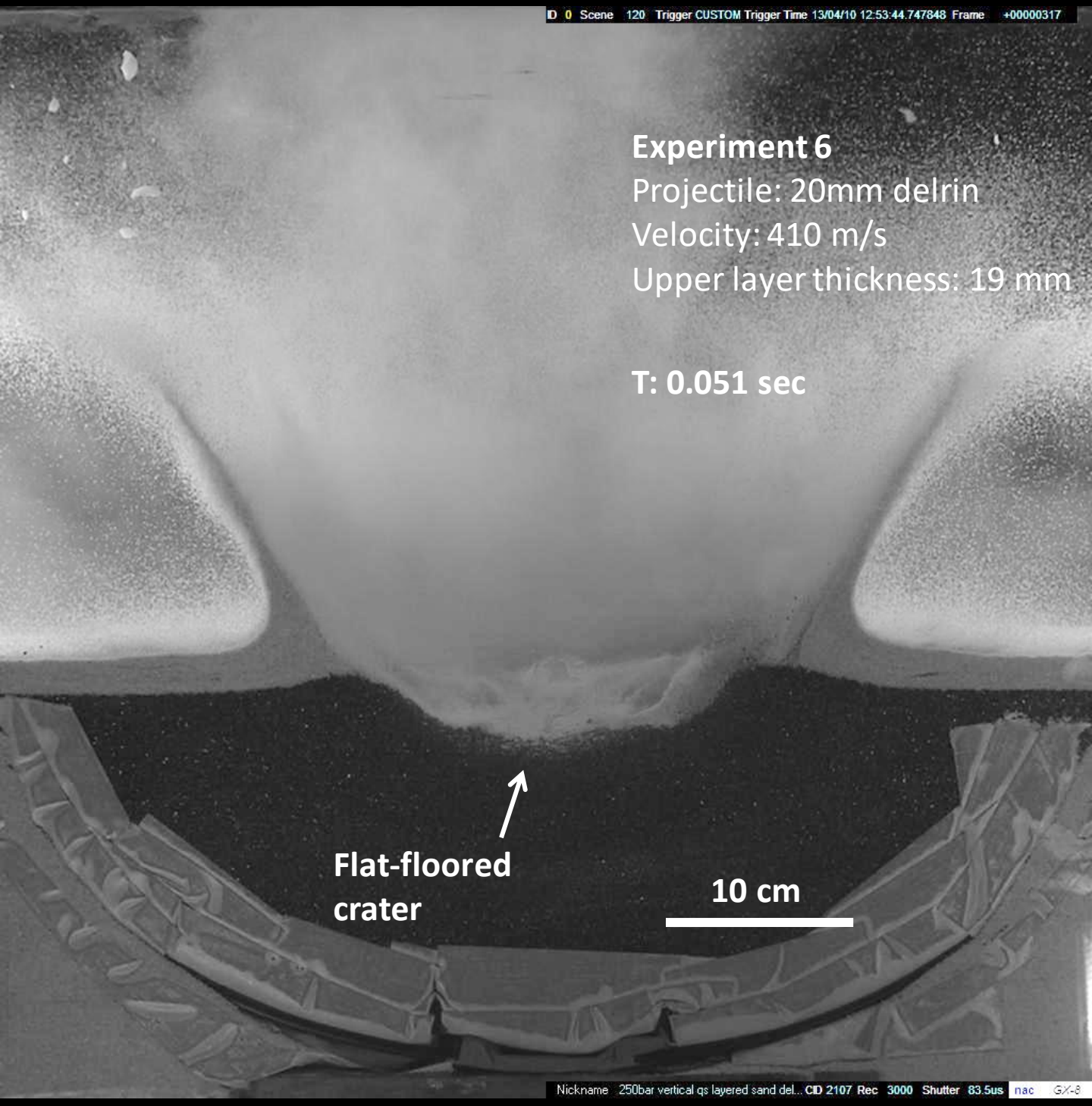

ID 0 Scene 115 Trigger CUSTOM Trigger Time 13/04/09 18:19:54.760211 Frame +00000730
Experiment 5
Projectile: 20mm delrin
Velocity: 421 m/s
Upper layer thickness: 11 mm
T: 0.102 sec (Transient crater)
Layering of ejecta
Flat-floored crater
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

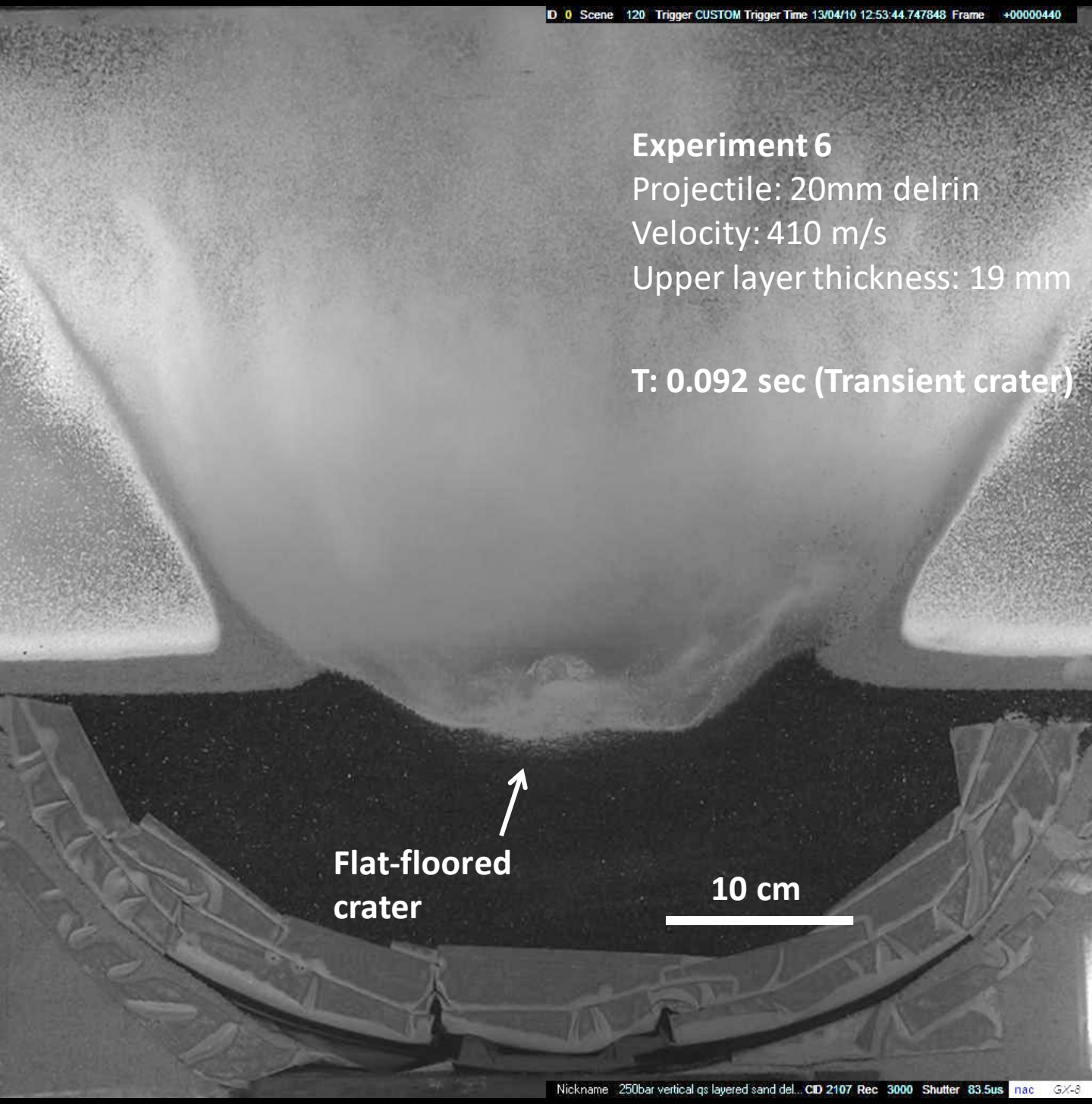

ID 0 Scene 115 Trigger CUSTOM Trigger Time 13/04/09 18:19:54.760211 Frame +00000937
Experiment 5
Projectile: 20mm delrin
Velocity: 421 m/s
Upper layer thickness: 11 mm
T: 0.171 sec
Flat-floored crater
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

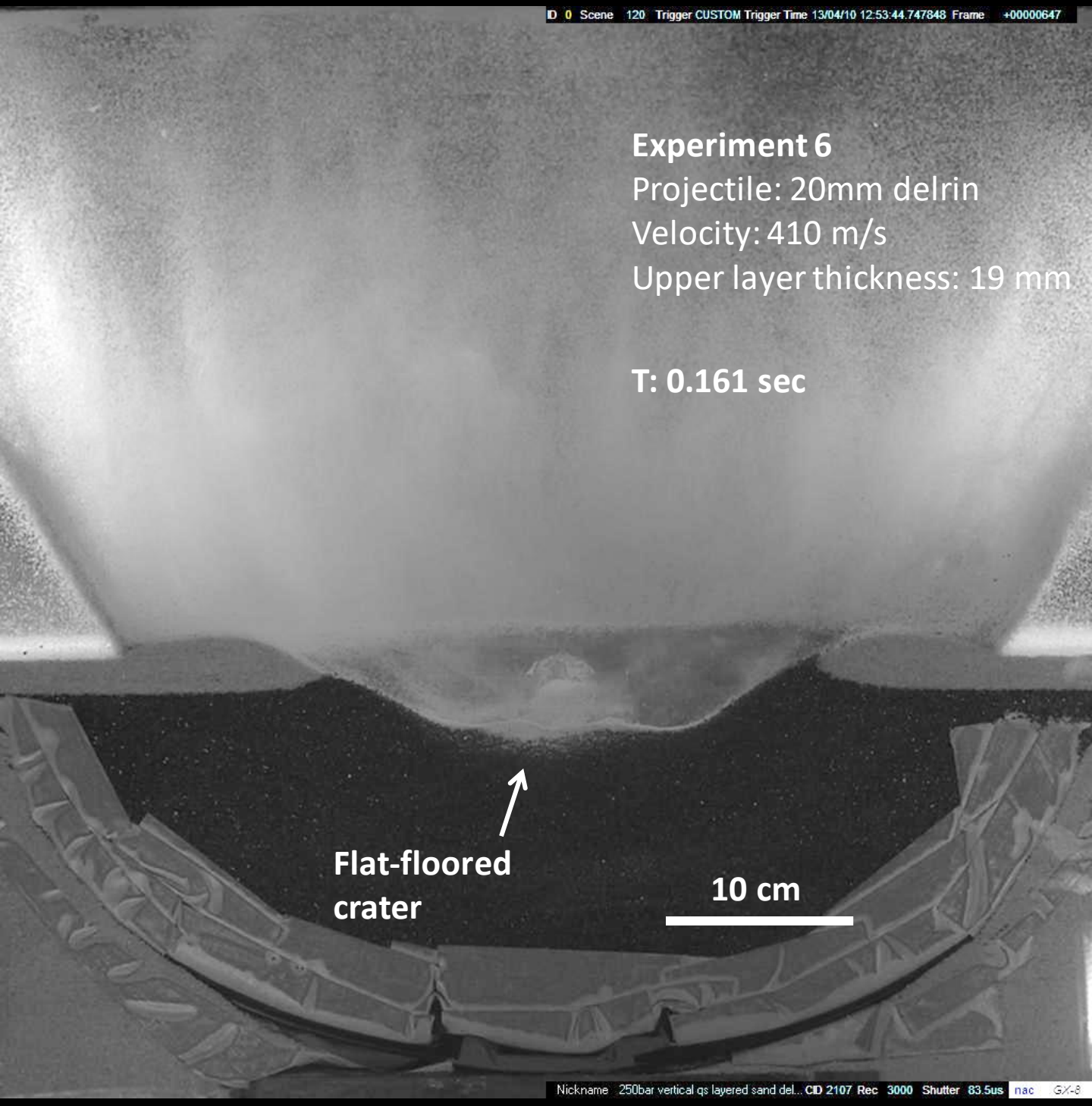

ID 0 Scene 115 Trigger CUSTOM Trigger Time 13/04/09 18:19:54.760211 Frame +00001280
Experiment 5
Projectile: 20mm delrin
Velocity: 421 m/s
Upper layer thickness: 11 mm
Final crater
Outer rim
Inner rim
Flat-floored crater
10 cm
Nickname 265bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8

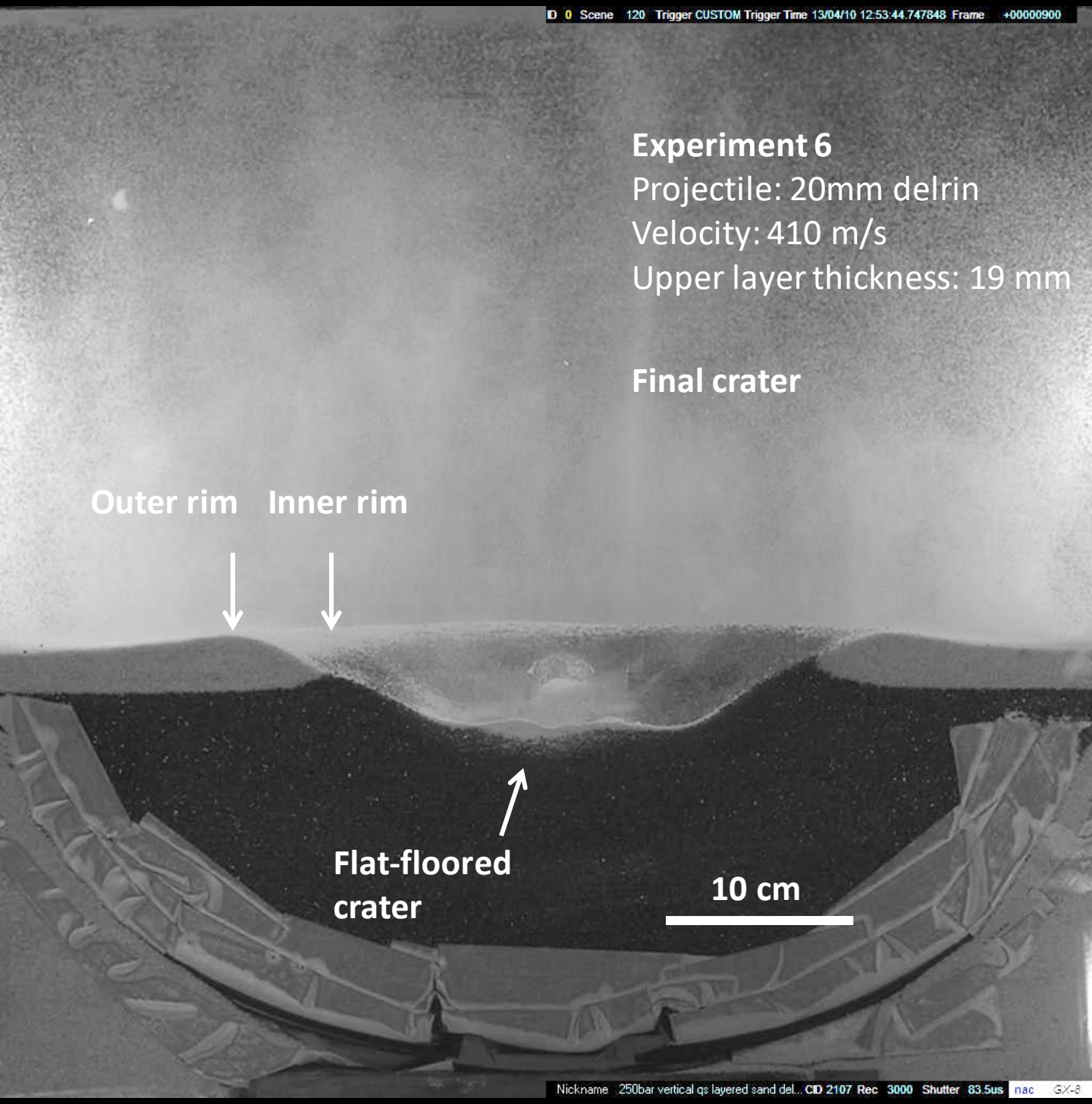

ID 0 Scene 120 Trigger CUSTOM Trigger Time 13/04/10 12:53:44.747848 Frame +00000164
Experiment 6
Projectile: 20mm delrin
Velocity: 410 m/s
Upper layer thickness: 19 mm
T: 0 sec
10 cm
Nickname 250bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8


ID 0 Scene 120 Trigger CUSTOM Trigger Time 13/04/10 12:53:44.747848 Frame +00000272
Experiment 6
Projectile: 20mm delrin
Velocity: 410 m/s
Upper layer thickness: 19 mm
T: 0.036 sec
Development of a brim, but less of separate curtains
Minor zones of decompression
Flat-floored crater
10 cm
Nickname 250bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8


ID 0 Scene 120 Trigger CUSTOM Trigger Time 13/04/10 12:53:44.747848 Frame +00000317
Experiment 6
Projectile: 20mm delrin
Velocity: 410 m/s
Upper layer thickness: 19 mm
T: 0.051 sec
Flat-floored crater
10 cm
Nickname 250bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8


ID 0 Scene 120 Trigger CUSTOM Trigger Time 13/04/10 12:53:44.747848 Frame +00000440
Experiment 6
Projectile: 20mm delrin
Velocity: 410 m/s
Upper layer thickness: 19 mm
T: 0.092 sec (Transient crater)
Flat-floored crater
10 cm
Nickname 250bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8


ID 0 Scene 120 Trigger CUSTOM Trigger Time 13/04/10 12:53:44.747848 Frame +00000647
Experiment 6
Projectile: 20mm delrin
Velocity: 410 m/s
Upper layer thickness: 19 mm
T: 0.161 sec
Flat-floored crater
10 cm
Nickname 250bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8


ID 0 Scene 120 Trigger CUSTOM Trigger Time 13/04/10 12:53:44.747848 Frame +00000900
Experiment 6
Projectile: 20mm delrin
Velocity: 410 m/s
Upper layer thickness: 19 mm
Final crater
Outer rim
Inner rim
Flat-floored crater
10 cm
Nickname 250bar vertical qs layered sand del... CID 2107 Rec 3000 Shutter 83.5us nac GX-8