

Abstract Submitted
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Aging near smooth and rough boundaries in a 3D colloidal glass¹

CONG CAO, ERIC WEEKS, Emory Univ — We study dense (glassy) bidisperse colloidal samples near a wall with both smooth and rough boundary conditions. Using a confocal microscope we directly observe the slowing of particles' motion (aging phenomena) in both samples. With a smooth boundary, due to the wall induced layer-like structures, we notice that particles' dynamics slow down when near the wall, with aging process quench faster than the bulk area. Motions perpendicular to the wall are severely restricted by the wall, leading to fewer particle exchanges between layers. With the rough boundary, the layer-like structures greatly diminishes. At the same time, the particles' dynamics shows no distinct differences between boundary and bulk. These rough boundary observations indicate the aging process is more strongly influenced by energetic interactions with the wall than by entropic interactions (the latter are due to the confinement imposed by the wall and would be similar for both smooth and rough walls).

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