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**Optimal conditions for particle-bubble attachment in flotation: an experimental study** AARON SANCHEZ YANEZ, JOSE FEDERICO HERNANDEZ SANCHEZ, SIGURDUR T. THORODDSEN, King Abdullah University of Science and Technology — Mineral flotation is a process used in the mining industry for separating solid particles of different sizes and densities. The separation is done by injecting bubbles into a slurry where the particles attach to them, forming floating aggregates. The attachment depends mainly on the bubbles and particles sizes as well as the hydrophobicity and roughness of the particles. We simplified the collective behavior in the industrial process to a single free particle-bubble collision, in contrast with previous studies where one of the two was kept fixed. We experimentally investigated the collision of spherical solid particles of a fixed diameter with bubbles of different sizes. By controlling the initial relative offset of the bubble and the particle, we conducted experiments observing their interaction. Recording with two synchronized high-speed cameras, perpendicular to each other, we can reconstruct the tridimensional trajectories of the bubble, the solid particle, and the aggregate. We describe the conditions for which the attachment happens in terms of dimensionless parameters such as the Ohnesorge number, the relative particle-bubble offset and the hydrophobicity of the particle surface. We furthermore investigate the role of the surface roughness in the attachment.

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