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On the collision between small solid particules and spherical bubbles DOMINIQUE LEGENDRE, IMFT, Toulouse, VINCENT SARROT, PASCAL GUIRAUD, LIPE-INSA, Toulouse, IMFT-INTERFACE COLLABORATION, LIPE-INSA COLLABORATION — The capture of solid particles by bubbles is present in many processes in mining industries, water purification. An overall efficiency is usually defined as the ratio between the number of particles captured by a bubble and the number of particles located in the volume swept by the bubble. The aim of this work is to consider the collision event and more precisely the effect of the bubble contamination on the collision efficiency. For this purpose, this study focuses on the collision mechanism between a spherical bubble and small particles when particles are small enough to follow the streamlines of the flow generated by the bubble motion. This situation corresponds to the one classically encountered in a lot of flotation processes. This study is based on Direct Numerical Simulation (DNS) and analytical justifications. Numerical results are obtained for a wide range of bubble Reynolds numbers (based on bubble diameter db) and for different angles of contamination. The collision efficiency is found to be significantly dependent on both the Reynolds number and the level of contamination.

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