Wall collision of deformable bubbles in the creeping flow regime
(Supporting Data)

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1 Sample results

Sample results for a bubble colliding with a solid wall are provided (Case D2 in [1]), including results in HDF5 format (see `Results/` folder) for dimensionless time from $\tau \approx -15$ to $\tau \approx 30$ (with the origin of time as defined in [1]) in intervals of $\tau = t/t_c = 1$ with the characteristic time being $t_c = 0.771356\,\mathrm{s}$. The bubble has a capillary number of $\mathrm{Ca} = 5$, a Reynolds number $\mathrm{Re} = 0.3704$, a Morton number of $\mathrm{Mo} = 1.119 \times 10^4$, with a density ratio of 0.1 and a viscosity ratio of 0.05.

The HDF5 files can be openend with a number of free as well as commerical post-processing softwares, such as `ParaView` (http://www.paraview.org/). The variables names in these files have the following meaning:

- `Colour` is the colour function γ of the VOF method and represents the local volume fraction of the dispersed phase.
- `Pressure` is the pressure field p [Pa s].
- `Velocity0` is the velocity vector field $\boldsymbol{u}$ [m s^{-1}], with its components u, v and w.
- `VFrac0` is a computational factor that is irrelevant for the current results.

Furthermore, the sample results also include a text file, called `bubbleWallDistance`, with the time (column 1, unit: s), the film thickness h (column 2, unit: m) and the distance between the center of mass of the bubble and the wall l (column 3, unit: m).

2 `Gmsh` geometry file

The attached file `bubbeWallCollisionMesh.geo` is a geometry file for the open-source meshing software `Gmsh` (http://gmsh.info/). With this geometry file `Gmsh`, the original three-dimensional mesh used for the simulations presented in this article can be created using `Gmsh`.

References

[1] F. Denner, Wall collision of deformable bubbles in the creeping flow regime, European Journal of Mechanics - B/Fluids (2018).

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