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Interaction between two drops ascending in a linearly stratified fluid

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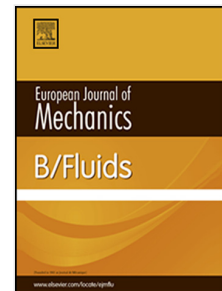
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1 Interaction between two drops ascending in a linearly stratified fluid

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56 **Abstract**

7 Three-dimensional numerical simulations of the interaction between two drops rising
8 in a thermally stable stratified fluid are presented. The governing equations are solved
9 by a finite-volume/front-tracking method. The influence of stratification on the
10 dynamics of two drops moving in line and side by side is studied. For the case of
11 nearly spherical drops ascending side by side, drops remain in the horizontal
12 alignment during the interaction; but the rate of separation, after their initial collision,
13 decreases as the stratification becomes stronger. We demonstrate that, in contrast to
14 the case of homogeneous fluid, two drops moving in tandem in a linearly stratified
15 fluid retain their in-line configuration. In addition, the vortical structure behind the
16 drops ascending in a linearly stratified fluid is shown to be the reason for the smaller
17 magnitude of rise velocity of drops compared to that in a homogeneous fluid.

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19 **Keywords:** Stratified fluid, Drop, Finite volume, Front-tracking method.
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