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Formation number of positively and negatively buoyant vortex rings JAVIER RODRÍGUEZ-RODRÍGUEZ, CAROLINA MARUGÁN-CRUZ, Carlos III University of Madrid, CARLOS MARTÍNEZ-BAZÁN, University of Jaen — The formation process of both negatively and positively buoyant vortex rings in a piston/cylinder arrangement is investigated numerically with the aim of understanding the effect of buoyancy, characterized by a Richardson number, on the formation number. More specifically, the study focuses on how vorticity is distributed inside the vortex ring and how this vorticity distribution compares with the neutrally buoyant case. It is well known that the kinetic energy of a neutrally buoyant vortex ring, when made dimensionless with its impulse and circulation, has a universal value of $E_{nd}1/3$. The limits of validity of this value for moderate Richardson numbers, both in the positively and negatively buoyant cases, are examined.

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