

عنوان مقاله:

Experimental Analysis on the Counter-Current Dumitrescu- Taylor Bubble Flow in a Smooth Vertical Conduct of Small Diameter

محل انتشار:

دوماهنامه مکانیک سیالات کاربردی، دوره 4، شماره 4 (سال: 1391)

تعداد صفحات اصل مقاله: 14

نویسندگان:

S. Benattalah - *Université Mentouri, Faculté des Sciences, Département de Physique, Laboratoire de Physique Énergétique Ain El Bey ۲۵۰۰۰, Constantine, Algérie*

F. Aloui - *Université de Nantes, Faculté des Sciences et des Techniques, Département de Physique, ۲, rue de la Houssinière BP ۹۲۲۰۸ - ۴۴۳۲۲ Nantes Cedex ۰۳, France*

M. Souhar - *ENSEM- INPL, LEMTA (CNRS UMR ۸۷۵) - ۲, avenue de la forêt de haye ۵۴۵۱۶, Vandoeuvre-Les-Nancy, France*

خلاصه مقاله:

In this paper, an experimental investigation on the Dumitrescu-Taylor bubble in counter-current laminar downward flow in vertical pipe of a small internal diameter pipe is presented. The experimental design is realized to work for low and stable liquid flow rates. The Dumitrescu-Taylor bubble may be stationary or can be in motion with an ascending or descending velocity, and this displacement depends on the downward liquid flow rates. Consequently, the advantage of this device is to carry out the measurements of the velocities inside the gas Dumitrescu-Taylor bubble by Laser Doppler Velocimetry (LDV). Starting from the visual observations and image acquisitions with a fast camera, a qualitative description was brought on the hydrodynamic behavior of the liquid film and the ripples created at the bottom of the Dumitrescu-Taylor bubble. The experimental results show a presence of a long toroidal vortex inside the gas bubble. It should be noted that previous work using a hot wire does not show the existence of this vortex. Additionally, other hydrodynamic magnitudes were measured as the liquid film thickness, the Dumitrescu-Taylor bubble rising velocity as well as the erosion bubble. Detailed descriptions are brought concerned this erosion. Strange phenomena have been observed primarily ahead of the nose of bubble and on the side of its end.

کلمات کلیدی:

Taylor bubble, Two, current laminar flow, Phase flow, Experimental study, Velocity profiles inside the gas Taylor bubble, Film thickness, Counter, Rising velocity, Ripples

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1385063>



