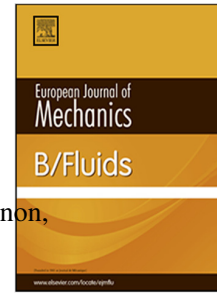


Accepted Manuscript

Experimental investigation of a round jet impacting a disk engraved with radial grooves

Sofiene Ouled Taleb Salah, Alexis Duchesne, Nicolas De Cock, Mathieu Massinon, Khaled Sassi, Khaoula Abrougui, Frédéric Lebeau, Stéphane Dorbolo



PII: S0997-7546(17)30383-7

DOI: <https://doi.org/10.1016/j.euromechflu.2018.06.009>

Reference: EJMFLU 3320

To appear in: *European Journal of Mechanics / B Fluids*

Received date: 6 July 2017

Revised date: 12 June 2018

Accepted date: 19 June 2018

Please cite this article as: S. Ouled Taleb Salah, A. Duchesne, N. De Cock, M. Massinon, K. Sassi, K. Abrougui, F. Lebeau, S. Dorbolo, Experimental investigation of a round jet impacting a disk engraved with radial grooves, *European Journal of Mechanics / B Fluids* (2018), <https://doi.org/10.1016/j.euromechflu.2018.06.009>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Experimental investigation of a round jet impacting a disk engraved with radial grooves

Sofiene Ouled Taleb Salah^{a,b}, Alexis Duchesne^a, Nicolas De Cock^b, Mathieu Massinon^b, Khaled Sassi^c, Khaoula Abrougui^d, Frédéric Lebeau^b, Stéphane Dorbolo^a

^aUniversity of Liege, CESAM - GRASP, Institute of Physics, Building B5a, Sart Tilman, 4000 Liege, Belgium.

^bUniversity of Liege, TERRA Teaching and Research Center, Gembloux Agro - Bio Tech, Passage des déportés 2, 5030 Gembloux, Belgium.

^cUniversity of Carthage, Laboratory of Agronomy, National Agronomic Institute of Tunisia (INAT), 1082 Tunis, Tunisia.

^dDepartment of Horticultural Systems Engineering, Higher Institute of Agronomy, 4042 Sousse, Tunisia.

Abstract

The present work proposes to investigate the impact of a turbulent round jet on a disk. The disk diameter is one order of magnitude larger than the jet diameter but small enough to avoid the formation of a circular hydraulic jump. The case of a smooth disk is first studied as the reference case. We then report results obtained with a disk engraved along its circumference by a number N of radial grooves. The grooves are used to split the liquid sheet into multiple jets. According to the incoming flow rate Q and to the geometry of the groove, the number of jets n can be stable and corresponds to $2N$ jets and N jets, or variable, i.e. merged jets (mixed zone). Phase diagrams (Q, n) are deduced from measurements for different lengths of the groove. Finally, the obtained droplets are characterized in terms of diameters and velocities.

Keywords: groove, phase diagram, turbulent liquid sheets, turbulent atomisation of liquid sheets, jet numbers, droplet diameters, droplet velocities.

Email address: s.ouled@ulg.ac.be (Sofiene Ouled Taleb Salah)

Download English Version:

<https://daneshyari.com/en/article/7050781>

Download Persian Version:

<https://daneshyari.com/article/7050781>

[Daneshyari.com](https://daneshyari.com)