### **Accepted Manuscript**

Analysis on the Effects of Turbulent Inflow Conditions on Spray Primary Atomization in the Near-Field by Direct Numerical Simulation

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PII: \$0301-9322(17)30503-7

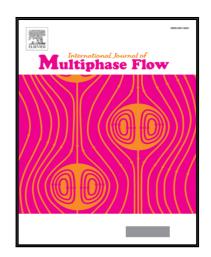
DOI: 10.1016/j.ijmultiphaseflow.2018.01.019

Reference: IJMF 2727

To appear in: International Journal of Multiphase Flow

Received date: 17 July 2017

Revised date: 13 December 2017 Accepted date: 22 January 2018



Please cite this article as: F.J. Salvador, Ruiz S., Marco Crialesi-Esposito, Ignacio Blanquer, Analysis on the Effects of Turbulent Inflow Conditions on Spray Primary Atomization in the Near-Field by Direct Numerical Simulation, *International Journal of Multiphase Flow* (2018), doi: 10.1016/j.ijmultiphaseflow.2018.01.019

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#### ACCEPTED MANUSCRIPT

#### Highlights

- A synthetic boundary condition for turbulence has been successfully implemented in the open source code DNS Paris-Simulator.
- Once implemented, the spray primary atomization process has been simulated for three cases with different levels of turbulence, quantified by the lengthscale and the turbulence intensity.
- Results from the simulations have been compared in terms of vorticity field, external non-perturbed length and intact core length which are directly related to the atomization level.
- Results reflect that atomization is greatly improved when the turbulence intensity and turbulence lengthscale are increased.
- The different atomization processes, occurring in different spray locations have been analyzed



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