THE INFLUENCE OF THE SPECIES DENSITY AND TURBULENCE INTENSITY ON THE SEPARATION OVER A BLUFF BODY IN A TURBULENT PIPE FLOW

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ABSTRACT

This file is an example LaTeXfile for submission to CFD2017. A limit of 15 pages applies (submitted file size < 10MB).

Keywords: CFD, Turbulence, Species, Separation .

A complete list of symbols used, with dimensions, is required.

NOMENCLATURE

Greek Symbols
ρ Mass density, $[{}^{kg}/_{m^3}]$
μ Dynamic viscosity, $[{}^{kg}/_{ms}]$

Latin Symbols
a PressureCharacteristic length, $[m]$.
N Total amount, $[-]$.
p Pressure, $[Pa]$.
$\mathbf{u}$ VolumeVelocity, $[{}^{m}/_{s}]$.

Sub/superscripts
G Gas.
i Index i.
j Index j.

INTRODUCTION

Industrial applications often make use of homogeneously mixed fluids or gases. PUT LITTLE EXAMPLE HERE.

The aim of this research is to find the influence of species density and turbulence intensity on the separation. A fluid or gas entering the system may include a total of N species. amidst the N species, there may be groups of species with identical density. Computational Fluid Dynamics (CFD) is used to solve the system of equations. For this particular problem, the mass, momentum and energy equations are solved (NOG MEER??). The simulations are performed for fully developed turbulent and incompressible flows. The turbulence is modelled trhough a $\kappa-\varepsilon$ model.

SOME PIECE ABOUT EXPECTATIONS??

The first part of this article is composed of the theory and the numerical solver used to attain the solution. Then CFD model is treated, after which the Geometry and boundary conditions applied to the problem are discussed. Subsequently the mesh convergence and executed simulations are explained. Finally, the results of the simulations are displayed with a discussion and conclusion.

PHYSICS

This chapter covers the theory behind the CFD model. Once the theory is explained, the discretization of the governing equations is treated. Additional to that the used solver is explained.

Turbulent flow

Here is how to produce a numbered equation under a second level heading (James *et al.*, 1988).

Continuity equation

$$\frac{\partial \rho_G}{\partial t} + \nabla (\rho_G \mathbf{u}) = 0 \tag{1}$$

Example of Sub-subheading

This is how (Luke, 1988) produced an unnumbered equation under a third level heading.

$$\mathbf{J} = \sigma(\mathbf{E} + \mathbf{u} \times \mathbf{B}) \tag{2}$$

Figure 1 shows the geometry used during the research

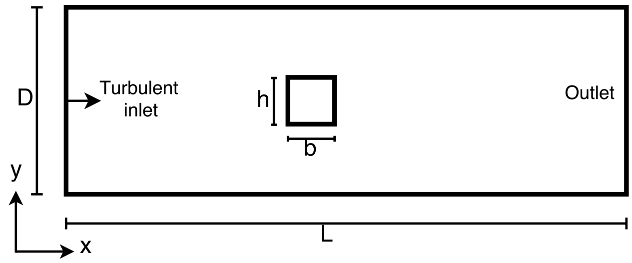

Figure 1: Schematic diagram of geometry.

RESULTS

The results of using the LaTeXtemplate is a great looking paper. In Figures 1 and 1 it can be seen how figures are easily included. In Table 1 it is seen how we can include a table. The table is constructed in the file table.tex, where also the table caption and label are defined.

Table 1: Modelling conditions.

CFD Run	ω	N_D	χ_a/χ_b	$\frac{a}{b_i}$	Γ_a	Γ_b
	First a					
AA01	0.0391	0.82	0.9469	0.041	203	0.123
AA02	0.8741	0.553	0.9528	0.399	7215	0.283
AA03	0.3654	0.958	0.5304	0.807	3049	0.35
AA04	0.8548	0.203	0.817	0.332	561	0.556
AA05	0.8676	0.215	0.7895	0.509	9207	0.123
AA06	0.1763	0.409	0.0698	0.995	7991	0.123
	First b					
BA11	0.9654	0.443	0.5503	0.927	9257	0.284
BA12	0.6548	0.191	0.5146	0.337	3357	0.042
BA13	0.9476	0.535	0.2801	0.939	9389	0.108
BA14	0.3063	0.071	0.364	0.454	4534	0.896
BA15	0.3982	0.091	0.9544	0.521	7331	0.911
BA16	0.9734	0.161	0.0897	0.388	1144	0.144
BA17	0.8912	0.123	0.4564	0.198	7744	0.912
BA18	0.2312	0.723	0.0218	0.12	6612	0.893
BA19	0.1243	0.107	0.849	1.289	2859	0.698

CONCLUSION

The conclusions are:

1. Trondheim is a nice city.
2. CFD is great fun, and useful too.

REFERENCES

JAMES, T., YING, A.C. and JOHNSEN, S.G. (1988). “A new technique for producing stencils”. *Proc. Int. Cong. on Stencils*. ABCD, Melbourne, Australia.

LUKE, T. (1988). “A new technique for stencil publishing”. *J. Stencils*, **5**, 179–221.

APPENDIX A

Give any additional information here.