



UNIVERSIDADE ESTADUAL DE CAMPINAS
Faculdade de Engenharia Civil, Arquitetura e Urbanismo

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Numerical Simulation of Head Loss in Pipes for Oil Extraction

**Simulação Numérica de Perda de Carga em Tubulações para Extração de
Petróleo**

Campinas
2024

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Dissertação de Mestrado apresentada à Faculdade de Engenharia Civil, Arquitetura e Urbanismo da Universidade Estadual de Campinas como parte dos requisitos para a obtenção do título de Mestre, na Área de Engenharia Civil.

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Advisor/Orientador: Prof. Dr. Philippe Remy Bernard Devloo

Co-advisor/Co-orientador: Prof. Dr. Nathan Shauer

Este exemplar corresponde à versão final da Dissertação de Mestrado apresentada por Carlos Henrique Chama Puga, orientada pelo Prof. Dr. Philippe Remy Bernard Devloo, e co-orientada pelo Prof. Dr. Nathan Shauer.

Campinas

2024

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“Quote here.”

- Author

Acknowledgements

Here you can write your acknowledgements. This is a very important part of your work, so take your time to write it. You can thank your family, friends, colleagues, professors, and anyone else who helped you during your research. You can also thank the funding agencies that supported your work.

Resumo

Este é o resumo em português do trabalho.

Abstract

This is the abstract in English of the work.

List of Figures

1.1 This is a figure 14

List of Tables

1.1 This is a table 14

Glossary

A1 This is the description of A1.

Acronyms

CFD Computational Fluid Dynamics.

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Chapter 1

Examples

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

1.1 Equation

This is something

$$a = 1, \tag{1.1}$$

Equation (1.1) represents something

1.2 Acronym and Glossary

[Computational Fluid Dynamics](#), which is abbreviated [CFD](#).

This is a glossary example: [A1](#)

1.3 Citation

The information of [1] is pretty good.

1.4 Figure



Figure 1.1: This is a figure

Figure 1.1 is a good example of something

1.5 Table

Table 1.1: This is a table

<i>Val</i> ₁	<i>Val</i> ₂
1	2
3	4

Table 1.1 is a good example of something

Bibliography

- [1] Pedro Lima. Automatic multiscale meshing for three-dimensional discrete fracture networks. Master's thesis, Universidade Estadual de Campinas, 2021.

Appendix A

Latex Questions

If you have any questions about the \LaTeX , check [here](#) for more information.