



Design, modeling and manufacturing via 3d printer of a reduced rotor model of a pelton turbine for teaching use

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The impact of rapid prototyping on engineering graduate universities using a single machine or a wide variety of prototyping techniques is widely discussed by many authors. In the past, manufacturing real models using a variety of model creation processes has improved undergraduate students' product design skills. The main advantage is the ability to check different hypothesis research parameters and allow improvement of project completion, reducing instrumentation manufacturing costs and test configurations, reducing the project-test-review cycle time and presenting students with lessons more research practices and problems. Thus, the experimental study through the reduced model of the rotor of a hydraulic turbine has its importance based on the fact that it is possible to analyze its behavior in the laboratory itself. The present work aims to design, model and manufacture, using a 3D printer, a reduced model of the Pelton turbine rotor for didactic use. The turbine rotor will be scaled in a real way and, later, reduced and an appropriate scale to manufacture a real model. Finally, its performance will be analyzed through computer simulation. The manufactured model will be printed to compose a didactic bench later built for use in practical classes. In this project, it is expected to obtain a bench for didactic use that, in addition to its use in research, can be used as a didactic resource in disciplines such as fluid mechanics and flow machines, taught in the undergraduate course in Mechanical Engineering, as a way of internalization of the content learned in the classroom.

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