Budapest University of Technology and Economics
Faculty of Mechanical Engineering
Department of Fluid Mechanics
http://www.ara.bme.hu/

FINAL PROJECT ASSIGNMENT

Publicly Available

Identification

Name: **Syzdykova Assiya**			ID: **73206514385**
Code of the Curriculum: 2NAAG0		Specialisation:	Document ref. number:
Curriculum:	Bachelor of Science Degree Program in Mechanical Engineering	2NAAG0-PE	GEÁT:2021-T:2NAAG0:SUCN7N
Final Project issued by: Department of Fluid Mechanics		Final exam organised by: Department of Fluid Mechanics	
Supervisor:	Joshua Patrick Davidson (71569852589), research fellow		

Project Description

Title	**Utilizing parametric resonance to enhance the performance of WEC** Paraméteres rezonancia felhasználása a WEC teljesítményének javításához
Details	Parametric resonance is an instability phenomenon caused by the time-varying parameters of a system. Whereas normal resonance causes oscillations in a system to grow linearly with time, parametric resonance causes an exponential increase in the oscillation amplitude. The concept of resonance is very well known in the study of wave energy conversion, since a wave energy converter (WEC) is usually designed to resonate with the incident waves for maximum power extraction. By comparison, parametric resonance has received far less attention. However, the large amplitude motions caused by parametric resonance might be beneficial by designing WECs to extract energy from these modes. This project will explore the possibility of increasing the energy capture of a wave energy converter, by periodically varying the inertia of the system and triggering parametric resonance. To achieve this goal the following specific tasks must be implemented: 1. Surveying and analysing relevant resources of technical literature 2. Creating a model for the system 3. Performing simulations with various parameter configurations, to assess the performance of the system 4. Analysing the results 5. Summarize the work in the required document format of the BSc Thesis.
Advisor	Advisor's Affiliation: Advisor: —

Final Exam

1st subject (group)	2nd subject (group)	3rd subject (group)	4th subject (group)
ZVEGEVGAG4X Vegyipari és áramlástechnikai gépek	**ZVEGEVGAGFF** Fluid Flow Systems	**ZVEGEENAG71** Energy Processes and Equipments	—

Authentication

Handed out: 8 February 2021		Deadline: 14 May 2021
Compiled by: Joshua Patrick Davidson (71569852589) Supervisor	Verified by: *Dr. János Vad* (signed) Head of Department	Approved by: *Dr. Péter Bihari* (signed) Vice-Dean

The undersigned declares that all prerequisites of the Final Project have been fully accomplished. Otherwise, the present assignment for the Final Project is to be considered invalid.

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Syzdykova Assiya