College of Engineering and Computer Science
Office of the Dean
777 Glades Road, EE96, Room 308
Boca Raton, FL 33431
561.297.3400

Announces the Ph.D. Dissertation Defense of

Radivoje Stankovic

for the degree of Doctor of Philosophy (Ph.D.)

On the Drainage Vortices of Liquid in a Container with Two Outlets

Wednesday 11/05/2025, 09:30 am
Engineering West Building, OE Conference Room # 187
777 Glades Road
Boca Raton, FL

DEPARTMENT: Ocean and Mechanical engineering

ADVISOR: Dr. Siddhartha Verma

PH.D. SUPERVISORY COMMITTEE: Dr. Manhar Dhanak, Dr. Myeongsub Kim, Dr. Tsung-Chow Su

ABSTRACT OF DISSERTATION
Vortices that form over multiple drainage ports may exhibit a distinct, periodic alternating behavior, whereby the air core moves periodically between different drainage ports. The physical processes which govern this behavior have not yet been explained, despite the widespread and thorough attempts to describe the flow of water through single or multiple outlets. Early experiments on the alternating behavior of this vortex resulted in a nondimensional relation between the alternating frequency and water height and container geometry with an R2 = 0.91. Subsequent 2D PIV measurements of the flow were performed at different laser heights of 25 mm and 128 mm. The measured velocity field was shown to be inconsistent with predictions from a proposed potential flow model where sinks and vortices are placed over each outlet via superposition. Through truncation of the singular value decomposition of the velocity field, the alternating behavior is also shown to be a fundamental flow structure for potential use in reduced order modeling. Fast Fourier Transforms of the same velocity field measured through PIV were used in an attempt to measure the switching or alternating frequency of the vortex, although no distinct peak was observed in the spectral analysis, covering slightly more than one full switching period.

BIOGRAPHICAL SKETCH
Radivoje Stankovic was born in Belgrade, Yugoslavia. He earned his BS degree in 2018 and continued to pursue a Ph.D. in the field, earning his MS degree along the way. During his study in Florida Atlantic University at SeaTech branch he focused on vortex formation when liquid drains from container through multiple outlets. Stan plans to continue being in this wonderful field.

CONCERNING PERIOD OF PREPARATION & QUALIFYING EXAMINATION

Time in Preparation: 5 years

Qualifying Examination Passed: 2020

Published Papers:

[1] Yanjun Li, Radivoje Stankovic, Bing Ouyang, Tsung-chow Su "Study on Flexural Properties of Tubular Underwater Inflated Structures Filled with Hydrogel Beads"