

## [030\_96]Reports of Research Institute for Applied Mechanics

<https://hdl.handle.net/2324/6779696>

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出版情報 : Reports of Research Institute for Applied Mechanics. 30 (96), 1983-02. 九州大学応用力学研究所  
バージョン :  
権利関係 :



**Summaries of Papers Published in *Bulletin of Research*  
*Institute for Applied Mechanics*  
(Japanese) No. 58 1982**

**Secondary Flow around Ridges on the Bottom Floor  
in an Oscillatory Water Tank**

By Masakazu TATSUNO

Circular cylinders, flat plates or a rigid wavy wall was fixed on the bottom floor of a water tank.

When the fluid in the tank was performed in sinusoidal oscillations along the floor, the secondary flows induced around the ridges were investigated experimentally by means of flow visualization techniques.

In the case of a single ridge, another circulatory streaming is induced near the bottom floor besides what is called the inner one and the outer.

In the case of several ridges at regular gaps, there exist two circulatory streamings in each gap.

Double structures of the inner circulatory streaming and the outer are induced over a rigid wavy wall.

**Observations of the Vertical Structure of Tidal Current, Water  
Temperature and Turbidity around Ainoshiba Island, Fukuoka**

By Arata KANEKO, Yoji SHIRAISHI and Hiroyuki HONJI

It has been observed that the vertical structure of tidal current around Ainoshiba Island, Fukuoka is changed remarkably by the direction of tidal current and the existence of thermal stratification. The result of observation also showed that turbidity near a sea bottom depends on the slope of thermal stratification rather than the velocity of tidal current.

**A Study on the Aerodynamic Responses of Bridge Deck Sections  
to Gusty Wind (Part 2)  
—Measurement of Indicial Lift Responses—**

By Takeshi YOSHIMURA, Yasuharu NAKAMURA,  
Ryozo ISHIDA and Shinsuke ARAMAKI

Indicial lift responses due to sharp-edged gust for bridge deck sections, which correspond to Küssner's function for an airfoil, are necessary to evaluate the aerodynamic responses to gusty wind in the time domain. This paper is concerned with experimental results of indicial lift responses for some geometrically simple bluff prismatic sections and an airfoil. Since sharp-edged gust is more conveniently realized in a water tank rather than in a wind tunnel, a towing water tank fitted a special apparatus, reported previously, was used in the experiment.

The main results of this paper are summarized in the followings.

- 1) Relatively good agreement is seen between the measured indicial lift response of an airfoil and a theoretical one.
- 2) The indicial lift responses for bluff prismatic sections are similar in trend to that for an airfoil.

**Turbulent Heating Experiments in TRIAM-1**

By Yukio NAKAMURA, Naoji HIRAKI, Kazuo NAKAMURA,  
Mitsuru KIKUCHI, Akihiro NAGAO, Yoshinobu KAWAI,  
Satoshi ITOH

The TRIAM-1 project started from 1977 has been progressing to realize a good confinement of high temperature and high density tokamak plasma, and to clarify that turbulent heating is effective for a further heating method of tokamak plasma. The main expected results have been almost obtained in the first step (1978-1979) of the TRIAM-1 project. In succession to the first step of the TRIAM-1 project, the second step (1980-1981) started with the purpose of elucidating the turbulent heating mechanism and establishing the turbulent heating as a further heating method of tokamak plasma. This paper describes the important results obtained in the second step as follows: (1) identification of ion acoustic instability excited by turbulent heating pulse, (2) production of high energy ions and the energy transfer from high energy ions to bulk ions, (3) effective turbulent heating in high density plasma ( $n_e \sim 1 \times 10^{14} \text{cm}^{-3}$ ), (4) effective turbulent heating with a double pulse.

### **A Testing Method for Ultra-High Speed Biaxial Elongation of Elastomers**

By Kiyoshi TAKAHASHI, Haruo KOMATSU and Ryuji HASHIMOTO

A new method is presented to test elastomers under biaxial large deformation at an extremely high speed. Adiabatic expansion of air due to explosively discharged heat through electric spark in air is employed for a pressure source for the deformation; the gaged portion of the sheet specimen, 10 mm in diameter, is expanded to form a hemispherical balloon. The maximum speed of the expansion exceeded 100 m/s. The growth of the balloon was observed by high speed photography as well as by an optical system which measured continuously the height of the balloon. Characteristics of the impact assembly are examined in detail by these methods. The critical surface strain at the onset of rupture for several elastomers are compared with the critical tensile strain under uniaxial loading for these materials. Oscillating behaviour of the balloon is observed, and the behaviour is discussed in relation to the material motion under the rebound-resilience measurement.

### **An Experiment on Solitary Bottom Waves**

By Hiroyuki HONJI and Yoji SHIRAISHI

Some results are reported of a flow-visualization experiment on the solitary bottom waves forming on the near-floor interface of a density-stratified two-layer system of water.

### **Formation of Streamwise Vortices in the Flow past a Corner**

By Sadatoshi TANEDA, Hajime AMAMOTO and Koji ISHI-I

The flow past a corner where two plane walls meet at an angle less than  $180^\circ$  was examined by means of the smoke wire method. It was found that the boundary layer forms streamwise vortices at the corner, whether the boundary layer is laminar or turbulent.

**The Wake behind a Rotating Plate**

By Sadatoshi TANEDA, Hajime AMAMOTO and Koji ISHI-I

The wake behind a rotating flat plate was examined by means of the smoke wire method. It was found that the wake forms an asymmetrical vortex street whose configuration varies largely with the speed of rotation.

**Visualisation of Ultrasonic Waves in Solids**

By Kazuo ARAKAWA, Kazumi MATSUSHIGE and Kiyoshi TAKAHASHI

Ultrasonic waves in polymeric solids are visualized by using pulsed-light photoelasticity. Difference in the oscillating behavior at the foot of the two kinds of transducers, longitudinal and transversal, is demonstrated. Furthermore, the reflection as well as the refraction of the propagating shear waves at existing slots in the testpieces is displayed.

**Bibliography on Natural and Man-made Reefs VI**

By Susumu INOUE