



## Review of experimental investigations of error analysis of offshore floating structural systems

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**Abstract:** *The experimental measured data is subject to uncertainties due to a many factors. These can be categorized as those which can be deleted, those which cannot be deleted or minimized. The main aim of the error analysis is to quantify the unavoidable errors and to estimate gross errors. In other words, the uncertainties in the measurement system are to be estimated and examined*

The experimental measured data is subject to uncertainties due to a many factors. These can be categorized as those which can be deleted, those which cannot be deleted or minimized. The main aim of the error analysis is to quantify the unavoidable errors and to estimate gross errors. In other words, the uncertainties in the measurement system are to be estimated and examined

The errors in experimental observations are gross errors, systematic errors and random errors. Gross errors are mainly human errors. These errors includes mistakes in reading instruments, using wrong settings, making wrong entries, and doing wrong calculations on measurement results. These errors dont follow any statistical description and cannot be easily eliminated. But these errors can be avoided by taking great care and repeating the measurements. Systematic errors are errors which may be evaluated and in many cases, can be corrected. These can be instrumental errors, environmental errors, and observational errors. Instrumental errors are caused due to defects in the instruments, improper use, loading errors etc.

An example of improper use is that of using the instrument outside its range of measurement. Loading effect means the changes in the measured quantity due to the introduction of the measuring instrument. Environmental errors include the errors due to variations in temperature, pressure, humidity, and external magnetic fields. These errors may be eliminated or reduced keeping environmental parameters constant during the period of observation, using instruments like self compensating gauges and vacuum sealed instruments. These can also be corrected by computing the errors due to these factors.

Observational errors occur due to the errors in reading the instrument like parallax error. This also depends on the person taking the reading. In spite of the precision of the instrument, two persons may record different readings. In the present experimental study, the various data from the different instruments were acquired through a computer based system

and hence most of the observational and recording errors are eliminated. The auto zero adjustment in the data acquisition system minimizes the zero error to negligible values. The calibrations factors were incorporated in the data acquisition program and thus, the possible mistakes in computation were also reduced. The uncertainties in the calibration and measurement stages for all the instruments in the system are estimated.

As an attempt to meet the challenges in deepwater testing by way of innovative experimental methods, the hydrodynamic behavior of offshore floating structural system was carried out and successfully simulated experimentally. The salient details in computation of errors carried out were examined