



ID: P3.1-102

Type: e-Poster

approach for determination of suspended mass displacements in seismometry

Thursday, 1 July 2021 11:45 (15 minutes)

In this research, a new approach based on the moiré technique is presented to calculate the displacement of the suspended mass in seismometers. The oscillating system consists of a spring-suspended mass whose position is monitored using the moiré technique. To form the moiré pattern, two similar Ronchi gratings are used so that they are facing each other without physical contact. One of the gratings is fixed to the oscillating mass and the other to the body of the oscillating system. An arrangement consisting of a laser diode, a narrow slit, and a photodiode was also used to detect and record the signal from the displacement of the moiré fringes due to the oscillation of the suspended mass. Also, an algorithm for calculations and conversion of the electrical signal into the displacement signal is presented. To validate the equations and the proposed algorithm, simulated and real data were evaluated and the results were compared. The results show the high capability and accuracy of the moiré technique and proposed algorithm in determining the oscillating mass displacement.

Promotional text

This research demonstrates a novel method to calculate the displacement of the suspended mass in seismometers that is very important in seismometry. This method is based on the moiré technique and an algorithm to process the recorded signals.

Primary author: Mr ESMAELI, Shamseddin (Razi University of Kermanshah, Kermanshah, Iran)

Co-author: Mr ANSARI, Anooshiravan (International Institute of Earthquake Engineering and Seismology (IEES), Tehran, Iran)

Presenter: Mr ANSARI, Anooshiravan (International Institute of Earthquake Engineering and Seismology (IEES), Tehran, Iran)

Session Classification: T3.1 e-poster session

Track Classification: Theme 3. Verification Technologies and Technique Application: T3.1 - Design of Sensor Systems and Advanced Sensor Technologies