Contribution ID: **201** Contribution code: **S1 Physics Innovation** Type: **Poster Presentation**

Fabrication and Evaluation of Soil Pressure Sensor for Stress State Transducer

The actual stress measurement is important to the studies in soil mechanics. The sensor that measures the stress must be thoroughly designed and assessed with the soil medium since the soil-structure interaction is complex and depends on many factors. This article presented the design and fabrication of the diaphragm type of soil stress sensor with the built-in amplifier and compared the properties and phenomena with the commercial pressure sensor for applying the sensors to be a soil stress state transducer (SST). The prototype soil sensor made of the diaphragm strain gauge was bonded on a 15-mm circular membrane that was analyzed by the linear finite element method with the pressure ranges of 0-500 kPa. The experimental procedures were divided into two steps: the air calibration to evaluate the basic properties of the sensor and the granular materials to determine the effect of particle size and layer thickness. The results found that the prototype sensor showed the high linear with the coefficient of determination (R^2) of 0.99, the hysteresis error of 5.45% and the 3.14% of non-linearity error for the air calibration. As the values of the sensor in the two kinds of the granular media were over the register pressure and the proper applied condition should be performed below 60 mm from the bearing surface.

Author: KULKETWONG, Chompoonud

Co-author: THUNGSOTANON, Dithaporn

Presenter: KULKETWONG, Chompoonud

Session Classification: Poster: S1 Physics innovation

Track Classification: Physics Innovation