

## **ABSTRACT**

*This research used inverting amplifier to discover electrical characteristic of concrete with combinations of cement mass. Concrete was made in 7 sample. Comparison of sand and cement 7:11 until 7:35. Measurement of output voltage was done and converted to capacitance and permittivity value, as capacitive sensor was used. Capacitive sensor is a sensor to detect electrical parameter changes by capacitive theory concept. Capacitive sensor used two face-to-face plated electrodes with empty hole in between. The electric charge loaded to sensor was affected by distance and surface area changes of plates caused by changes of dielectric value of the measured material. In this research, application of capacitive sensor to determine permittivity of concrete with different mass of sand was studied. Optimum voltage and frequency for the measurement is 2 Vp-p and 10 kHz with the biggest permittivity change found in 7:35 sample and percentage voltage change  $6.53716 \times 10^{-5}\%$ .*

**Keynote :** *Inverting operational amplifier, Capacitive sensor*