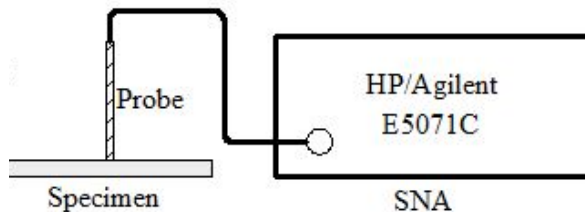
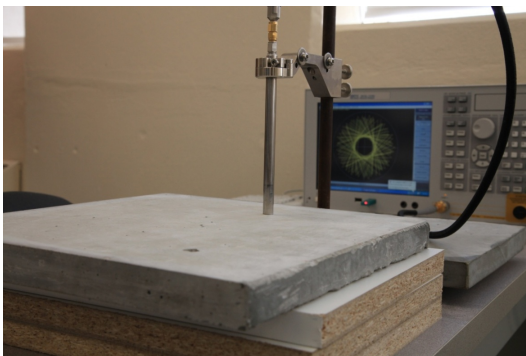
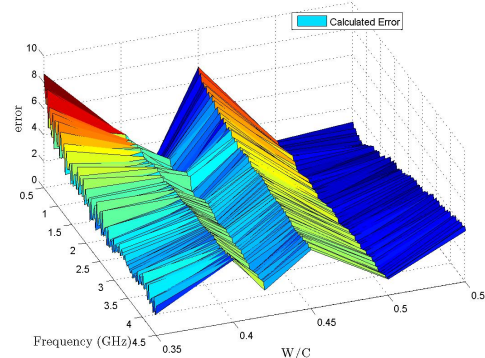
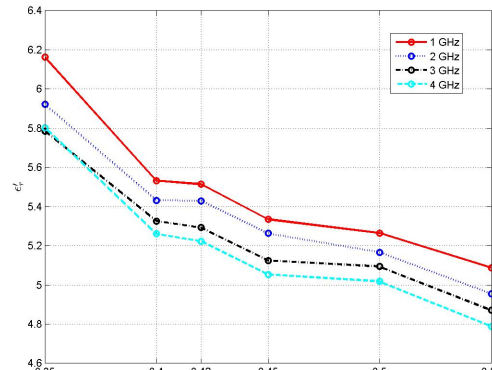


- Abstract:** Dielectric properties of construction materials like cement paste and cement mortar are of important to civil engineers using electromagnetic nondestructive testing (NDT) methods for the condition assessment and damage detection of aging civil infrastructure. In this research, variations of the water-to-cement (w/c) ratio and moisture content in the dielectric constant and loss factor measurements are experimentally investigated and theoretically modeled.
- Dielectric measurement:** Agilent dielectric coaxial performance probe (0.5GHz ~ 4.5GHz) and Agilent E5071C network analyzer.



- Result:** Dielectric constant decreases as the w/c ratio increases. Measurement errors are within 9%.



- Conclusions:** i) Change in dielectric constant due to the removal of evaporable water by oven drying was observed. Higher moisture contents leads to higher dielectric constants and loss factors of all samples; ii) Sufficient data points are needed in order to develop representative dielectric constant and loss factor of cementitious composites.



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**Ref:**

- **Solak, I.C.**, Master's Thesis, Dept. of Civil & Envir. Eng, UMass Lowell, June, 2011.
- **Solak, I.C.**, T. Yu. Dielectric Measurement and Modeling of Cementitious Composite Panels Using a Coaxial Probe. In: *Proc SPIE Smart Structures/ NDE Conf.*, San Diego, CA; 2011.