

Development of GPR imaging algorithm for detecting void-like defects in precast concrete structure

Taemin Lee¹⁾, Sung-Hyun Kim²⁾, Su-Min Kang³⁾, Hyeon-Jong Hwang⁴⁾,
and Hajin Choi⁵⁾*

^{1),2),3),5)} School of Architecture, Soongsil University, Seoul, Korea

⁴⁾ School of Architecture, Konkuk University, Seoul 05029, Korea

⁵⁾ hjchoi@ssu.ac.kr

ABSTRACT

In this study, GPR-based imaging algorithm is developed for detecting void-like defects in precast concrete (PC) structure. As developing a new concept of structural design in concrete, construction error and quality control has been the important issue. To identify structural safety, the engineers need to check the placement of reinforcing bars as well as unplanned materials inside concrete such as void and PVC pipe. GPR-based imaging algorithm has several advantages of real-time measurement and visualization of internal structural information. The developed algorithm was evaluated based on testing specimen including rebar, void and PVC pipe, and showed a great potential of detecting void-like defects inside concrete.

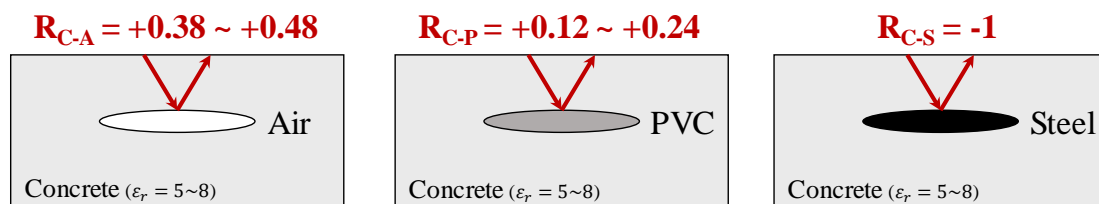


Fig. 1 Reflection coefficient according to reflectors

¹⁾ Ph.D student

²⁾ Researcher

³⁾ Associate Professor

⁴⁾ Associate Professor

⁵⁾ Assistant Professor

*The 2022 World Congress on
The 2022 Structures Congress (Structures22)
16-19, August, 2022, GECE, Seoul, Korea*

REFERENCES

- Krause, M., Milmann, B., Mielentz, F., Streicher, D., Redmer, B., Mayer, K., ... & Schickert, M. (2008). Ultrasonic imaging methods for investigation of post-tensioned concrete structures: a study of interfaces at artificial grouting faults and its verification. *Journal of Nondestructive Evaluation*, 27(1), 67-82.
- Choi, H., Bittner, J., & Popovics, J. S. (2016). Comparison of ultrasonic imaging techniques for full-scale reinforced concrete. *Transportation Research Record*, 2592(1), 126-135.