

# INFLUENCE OF CURING CONDITIONS ON THE MODULUS OF ELASTICITY OF CONCRETE – A STATISTICAL APPROACH

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**Abstract:** The well-know Pauw's formula is often used to predict the elastic modulus of concrete. It is a generic formula derived from empirical data, which does not account for model uncertainties. Curing of concrete at early age plays a significant role in the long-term behavior of concrete, and as a result will influence the strength and modulus of elasticity of concrete. Therefore, the role of curing on the long-term mechanical behavior of concrete cannot be ignored. When applying the Pauw's formula to predict the elastic modulus of concrete, there is no consideration for the curing factor. A framework to construct probabilistic models that expand upon Pauw's formula to include the effect of early-age curing in concrete is developed. Bayesian updating is used to assess the unknown model parameters based on observational data. A Bayesian step-wise deletion process is used to identify important explanatory function and construct parsimonious models. Based on a large number of experimental data on fresh concrete curing conditions, this paper aims to evaluate the influence of curing on the elastic moduli of concrete and develop a statistical framework to construct probabilistic models for elastic modulus of concrete that is subjected to different curing conditions.