



Department of Civil Engineering and Engineering Mechanics
Columbia University

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227 Mudd

On the Representative Volume Element of Asphalt Concrete at Low Temperature



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The representative volume element (RVE) of asphalt concrete is investigated based on statistical analysis and modeling of an extensive set of experimental data. The experimental part consisted of three-point bending creep tests performed on beams of different sizes. In the theoretical part, asphalt concrete specimens of different sizes were analyzed based on digital image analysis, micromechanics, and finite element modeling. The volumetric fractions and particle size distributions of the different specimen sizes were estimated from their binary images after digital processing. Detailed information on the internal structure of asphalt concrete was investigated by estimating the spatial correlation functions of specimens of different sizes. The presentation ends with a brief discussion on using experimental data on asphalt concrete to back calculate the properties of component asphalt binder.

Biosketch

Dr. Marasteanu is an Associate Professor of Civil Engineering and leads the asphalt research program in the Department of Civil Engineering at University of Minnesota. He has Ph.D. and MS degrees from Pennsylvania State University and Engineer Diploma from Technical University of Bucharest, Romania. He is a member of FHWA Asphalt Binder Expert Task Group, TRB Committee on Characteristics of Bituminous Materials, and ISAP work group (WG5) on the Re-Use of Construction Materials for Asphalt Pavements. He is also the Associate Editor of the International Journal of Road Materials and Pavement Design and has published over 70 papers and 25 technical reports.