

DIFFERENTIABILITY OF A SOLUTION OF A FREE BOUNDARY PROBLEM DESCRIBING WATER ADSORPTION

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Abstract. Sato-Aiki-Murase-Shirakawa [7, 16] proposed a free boundary problem in order to describe water adsorption appearing in moisture transport of concrete carbonation process. The problem is to find a pair of a curve and a function for given boundary and initial functions. In this paper we consider that the boundary and initial functions depend on some parameter. Kumazaki [9, 10] already proved the continuous and measurable properties of solutions with respect to the parameter. The aim of this paper is to establish differentiability of solutions with respect to the parameter as a new property. This result will be applied to research of the multi-scale model to water adsorption in concrete carbonation.

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