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# A novel protocol for rapid identification of anisotropic diffusion properties of polymer matrix composite materials with complex texture

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## Abstract

The paper focuses on a proposal for a novel protocol for the rapid identification of anisotropic diffusion properties of composite materials with complex texture. The method consists in performing small time gravimetric tests on composites samples and measuring the initial slope of their mass uptake curve with respect to  $\sqrt{t}$ . The identification is performed by employing the analytical expression of the slope of the curve in the anisotropic case, an extension of the Shen and Springer slope method for isotropic and orthotropic diffusion. Analysis and discussion are dealt within a planar anisotropic diffusion test case issued from the literature.

*Keywords:* Polymer-matrix composites (PMCs), Environmental degradation, Identification, Anisotropic diffusion behaviour, Slope method

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## 1. Introduction

The employment of polymer matrix composite materials with complex fibrous texture is foreseen in the next future for instance for the realization of warm ( $70^{\circ}\text{C} < T < 300^{\circ}\text{C}$ ) aeronautical structures. For the temperature range

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