NUMERICAL TESTS FOR SOIL EROSION REDUCTION SOLUTIONS UNDER THE ACTION OF THE WIND

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Rezumat. *Obiectul acestui studiu este de a realiza un model numeric al mișcării aerului deasupra unui teren nisipos prevăzut cu ecrane de protecție. La baza acestui model au stat o serie de teste fizice asupra curgerii aerului într-un tunel aerodinamic cu discontinuitate pentru care s-au obținut profile de viteză în diferite secțiuni aval de intrarea aerului. În urma simulării numerice a curgerii aerului în aceleași condiții ca cele din testele fizice s-au obținut profile de viteză în aceleași secțiuni aproape identice. Acest lucru a permis validarea modelului numeric și adaptarea acestuia pentru a simula mișcarea aerului din zona stratului limită atmosferic deasupra unui teren nisipos prevăzut cu un număr de ecrane permeabile de protecție având ca scop diminuarea vitezei vântului.*

Abstract. *The purpose of this study is to make a numerical model of air movement over a sandy terrain provided with protective screens. This model was based on a series of physical tests on air flow in a wind tunnel with discontinuity, for which velocity profiles were obtained in different sections downstream of the air inlet. Following the numerical simulation of the air flow under the same conditions as those of the physical tests, almost identical velocity profiles were obtained in the same sections. This allowed the validation of the numerical model and its adaptation to simulate the movement of air in the atmospheric boundary layer zone above a sandy terrain provided with a number of permeable protective screens with the aim of reducing the wind speed.*

Keywords: soil erosion by wind, permeable protection screen, numerical modelling, ANSYS Fluent LES, COMSOL k-ε turbulent model

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1. Introduction

One of the ways to reduce the phenomenon of erosion is by using permeable protective screens placed in the direction of wind flow, in areas strongly affected by wind erosion of soils, to reduce the air speed, which drives fine sand particles.

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