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NK-1型可移动式风蚀风洞洞体设计

Design of NK-1 type movable wind erosion tunnel body

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英文关键词:pressure distribution design computer simulation NK-1 movable wind erosion tunnel soil wind erosion

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中文摘要:

针对土壤风蚀研究的需求，依据空气动力学要求设计了NK-1型可移动式风蚀风洞。该风洞由进气段、动力段、过渡段、转角段、稳定段、收缩段、实验段和扩散段组成，总高2 456 mm，全长15 900 mm，能量比0.41。该风洞主要特点为：进气口为双扭线形唇口；转角段为20°仰角设计；稳定段采用六角形蜂窝器和两层阻尼网组合设计；实验段风速为0.3～20 m/s连续可调；尾部扩散段扩散角为20°。最后运用Fluent 6.3流体模拟软件，对空风洞实验段纵截面的气流速率分布、静压分布进行了模拟，满足设计要求。

英文摘要:

Aimed at the study on soil wind erosion, the movable wind erosion tunnel called NK-1 was designed based on the aerodynamic theory. It is composed of inlet section, drive section, transition section, turning segment, setting chamber, contractive segment, test section and diffusion section. It’s total length and height are 15 900 and 2 456 mm. The energy ratio is 0.41. The wind tunnel has some features which are expressed as the following aspects: the inlet lip curve is involute; there is a windward elevation angle of 20° in the turning segment; the setting chamber is embedded a steel hexagon honeycomb assembly and two steel sieves. The wind speed of the test section can be adjusted smoothly by a frequency actiyator within the speed range of 0.3-20 m/s. Divergence angle of 20° was designed for diffusion section. The fluid simulation software-Fluent 6.3 was applied to simulate static pressure and velocity distribution along longitudinal section in whole test section. The results indicate that the velocity and static pressure distribution of air current in test section can meet design requirements.

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