عنوان مقاله:

Numerical Method to Predict Slip Length in Turbulent Channel Flow

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خلاصه مقاله:

In the present research work, we introduce a new method for estimating the slip length on superhydrophobic surfaces. Hence, a dynamic force is added to momentum equations and velocity boundary condition is rewritten in a new form. Laminar and turbulent channel flows are considered and two force functions are used with different profiles to investigate their effects on results. The turbulent channel flow is considered at Re ۱۸۰ and the Large Eddy Simulation (LES) method has been applied to analyze this flow. All results indicate that this method can predict the streamwise slip length with a good accuracy, which is comparable with the Navier's method. So, using this numerical solution and also measuring pressure drop and mass flow rate in the channel, slip length can be calculated. Consequently, the errors and difficulties of slip length measurements in typical methods such as AFM and μPIV would be eliminated.

کلمات کلیدی:

Superhydrophobic, conservative force, slip length, Non, Large eddy simulation