FM9S_12266

XXI International Congress of Theoretical and Applied Mechanics
Warsaw, Poland, August 15–21, 2004

Dynamics of Separation Zone behind the 2D Hill in Oscillating Incident Wind.

Alicja Jarza, **Jaroslaw Ciechanowski**

Institute of Thermal Machinery, Department of Mechanical Engineering and Computer Science, Częstochowa, Poland

The experimental and numerical simulation of the unsteady wind phenomena around the 2D hill has been performed for different parameters of inflow periodicity. The modelled hill has been immersed in the boundary layer flow formed over the terrain of moderate roughness. To study the effect of periodical disturbances of the approaching wind the oscillating component superimposed on the mean velocity profile has been introduced. Experimental test has been done in wind tunnel equipped with fast-scanning acquisition system of X array hot-wire signal and devices generating unsteady wind boundary layer and . They numerical simulations, guiding the experimental tests programme, have been performed by the use of phase averaged form of RNG version of $k-\varepsilon$ turbulence model. The main finding of the simulations reveal the strong dependence between the characteristics of inflow periodicity and vorticity structure of separation region.

View the extended summary