

Abstract Submitted
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The flow past a circular patch of vegetation with a low submergence depth and low solid volume fractions GOKHAN KIRKIL, Kadir Has University — The effect of the Solid Volume Fraction (SVF) on the flow structure within and past a circular array of surface-mounted cylinders that extends over 75% of the water depth, h is investigated using Detached Eddy Simulation (DES). This set up mimics the case of a submerged patch of rigid vegetation in a channel. The diameter of the cylinders in the array is $d = 0.02D$, where D is the diameter of the circular array. The channel Reynolds number is close to 20,000 and the Reynolds number defined with D is around 24,000. DES is conducted for $SVF = 10\%$ and 25% . It is found that as the SVF increases, fairly strong horseshoe vortex system forms around the upstream face of the vegetation patch, the strength of the separated shear layers on the sides of the vegetation patch increases and the length of the recirculation region behind the patch decreases. While an increase of the SVF results in a large increase of the turbulent kinetic energy in the wake, the opposite is observed within the porous vegetation patch.

Gokhan Kirkil
Kadir Has University

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