TECHNISCHE UNIVERSITÄT DRESDEN

Institut für Strömungsmechanik, Professur für Strömungsmechanik

Vortrag

Flow and sediment erosion mechanisms around surface-mounted solid and porous cylinders

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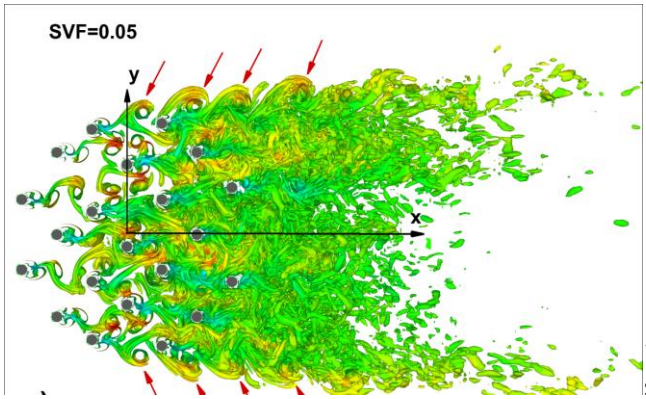
The talk discusses the dynamics of the large-scale coherent structures generated around surface mounted cylinders and their effects on sediment entrainment and local scour. Eddy resolving numerical simulations are used to investigate how the coherent structures and their role in scour change with varying shape of the cylinder, degree of flow shallowness and shape of the channel bed (e.g., from flat bed conditions corresponding to the start of the erosion-deposition process to equilibrium scour bed corresponding to the end of the erosion-deposition process). The second part of the talk focusses on how the coherent structures and sediment erosion mechanism change with increasing porosity of the cylinder. The main application is related to patches of vegetation in river channels. The wakes past the array of solid cylinders forming the porous cylinders are resolved. The effects of channel bathymetry, solid volume fraction, relative cylinder diameter and submergence of the porous cylinder are discussed.



Wake flow past a porous cylinder with a solid volume fraction SVF=0,05

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Ort: Zeuner-Bau, Raum 146/Z

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