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Characterization of turbulence characteristics near the circular pier

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Local scour near the piers is still a main reason of bridge failures. Maximum and temporal local scour depth estimation play an important role to river engineer. While many research articles that effort on scour estimation have been completed and available. Availability of the turbulence and flow characteristics near the bridge pier that shows the scour mechanism near the pier in equilibrium scour condition is still immature. Present study goals to calculate the comprehensive study on turbulence flow field near the pier in equilibrium scour hole in clear water scour condition using ADV. The three dimensional velocity components, size of primary horseshoe vortex, Reynolds shear stresses, turbulence intensities and turbulence kinetic energy near the pier in equilibrium scour condition that calculated for different pier diameters are presented in this study. The primary horseshoe vortex was found to main cause for scour processes. The size of primary horseshoe vortex are found to increases with increasing of pier diameter and maximum equilibrium scour depth. The regions of both the maximum turbulence intensity and Reynolds shear stress are found to format allocation upstream of the main vortex, where the large turbulent eddies have the highest possibility of occurrence. Outcomes of present provide a valuable experimental results for turbulence characteristics near the pier.