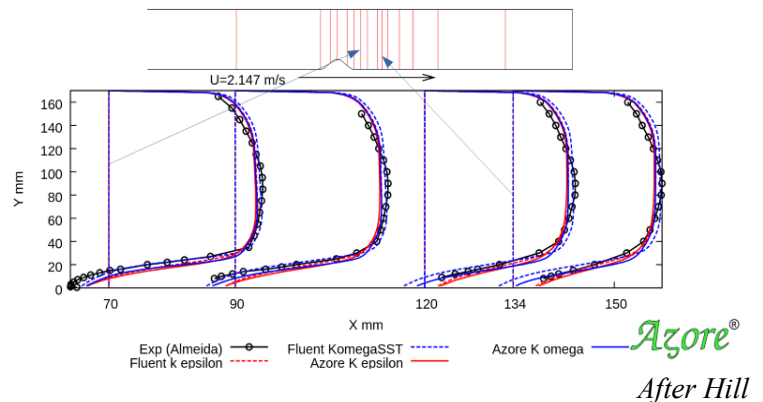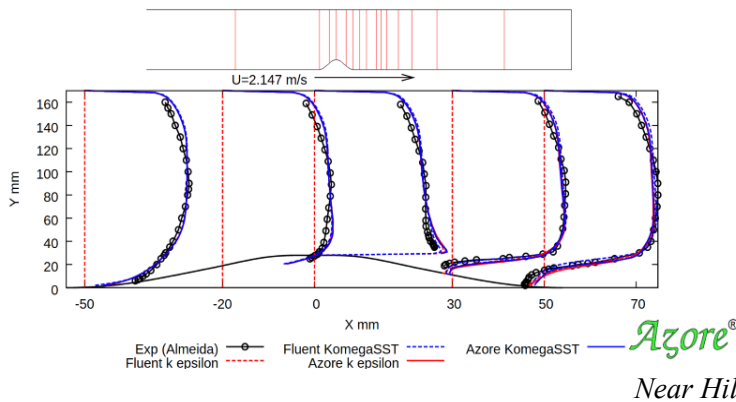Azore® CFD

2D Hill Benchmark

Engineering Challenge

This benchmark study looks at turbulence modeling over curved boundaries. The case of liquid flow through a two-dimensional slot with a hill has been documented by Almeida, Durao, and Heitor [1] with experimental data available via laser-doppler measurements. Particular attention is paid to the recirculating flows that occur in the lee of the hill.
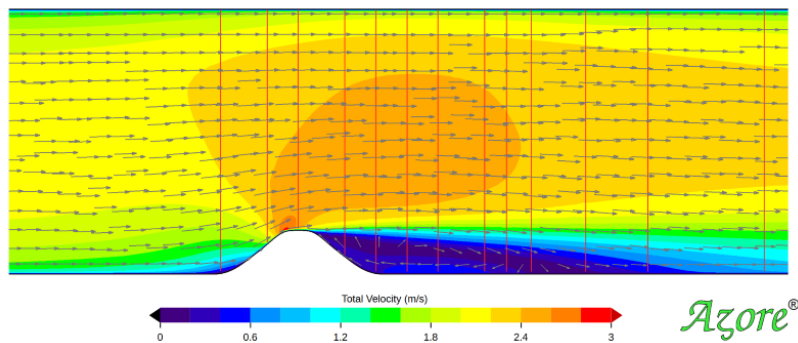
Azore Solution

Existing experimental data was compared to the Azore simulation results for multiple turbulence models, along with simulation results from a well-known commercial CFD package. Both tools make similar comparisons that represent the general flow structure.

The results of the simulation compared to the experimental data are shown in the figures below.

Near Hill

After Hill

The simulation results show minimal variation, between AzoreCFD and the well-known commercial CFD package, along with minimal variations between the two turbulence models. The models show strong agreement with the experimental data.

Read more about this benchmark, here.

[1] G. P. Almeida, D. F. G. Durao, and M. V. Heitor, Wake flows behind two dimensional hills, Exp. Thermal Fluid Science 7 (1992), 87.

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