# PHOENICS
# Impeller Pump Example

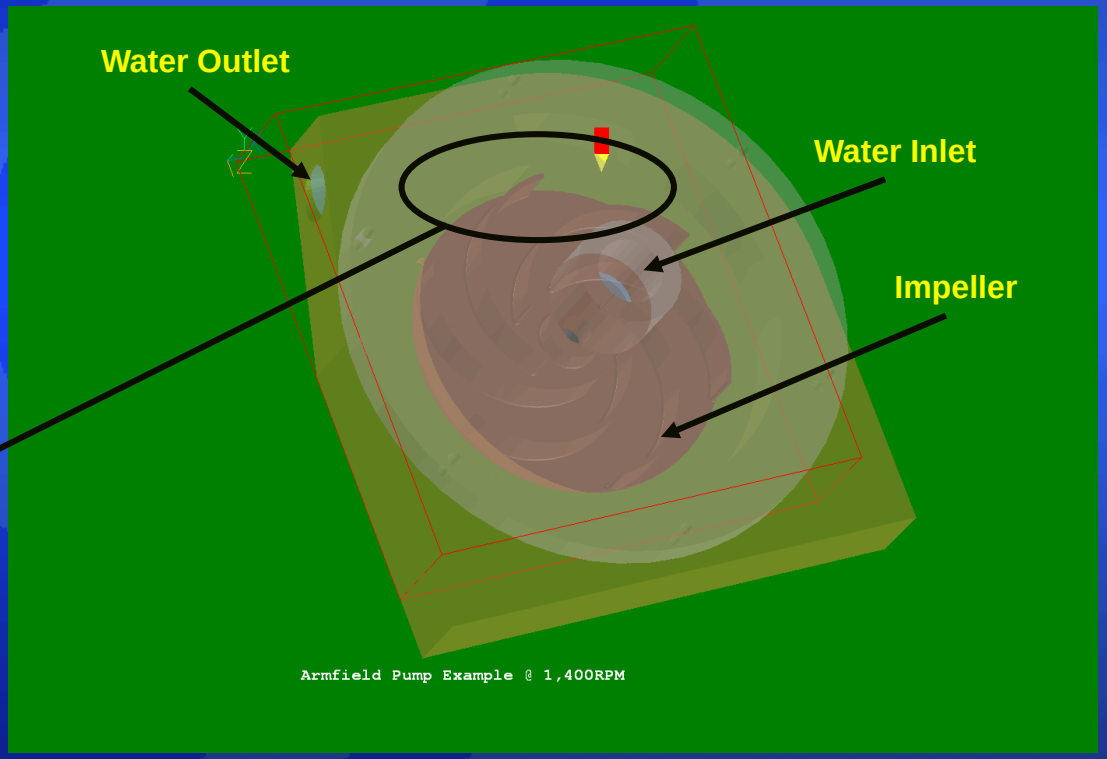
# Introduction

This presentation outlines the modeling of a simple impeller pump using PHOENICS. The model shown is a transient, moving body analysis, however steady state and start-up simulations can also be run with PHOENICS.

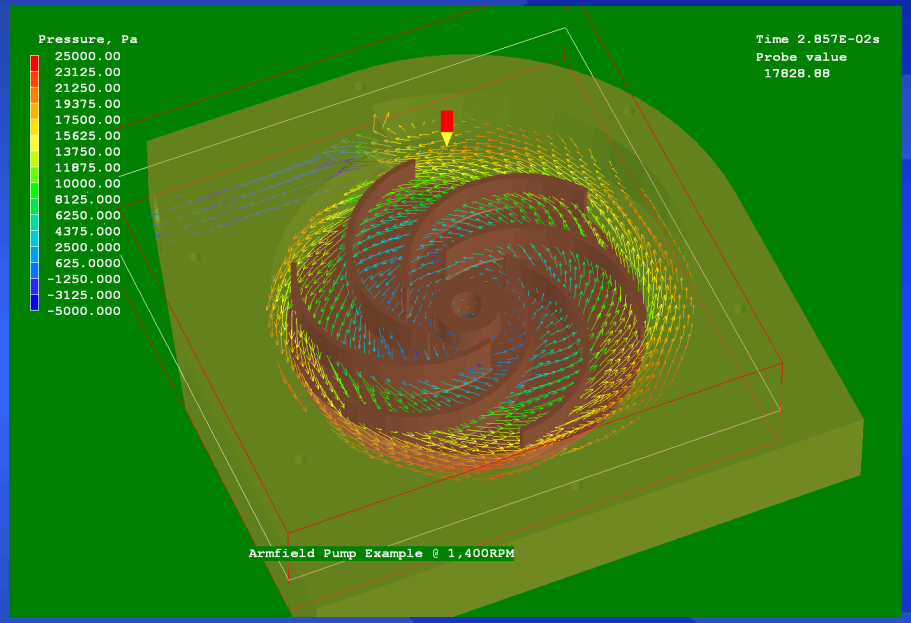
# The Geometry

General and detailed views of the pump geometry in the PHOENICS VR viewer. The cover is shown as transparent to aid visualisation.

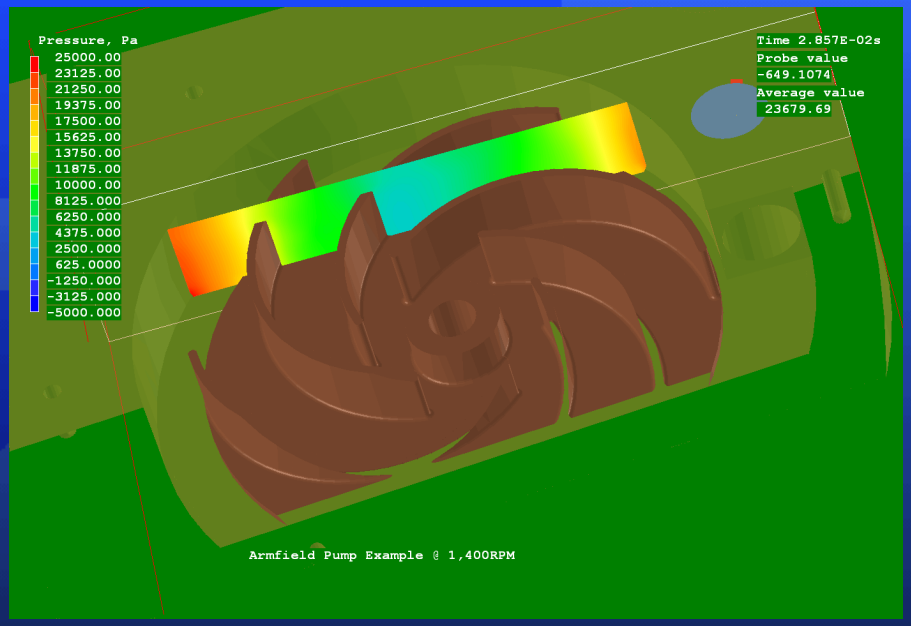
In this case the geometry was from stl files. Most CAD systems are capable of generating this file format.




# Results - Pressure

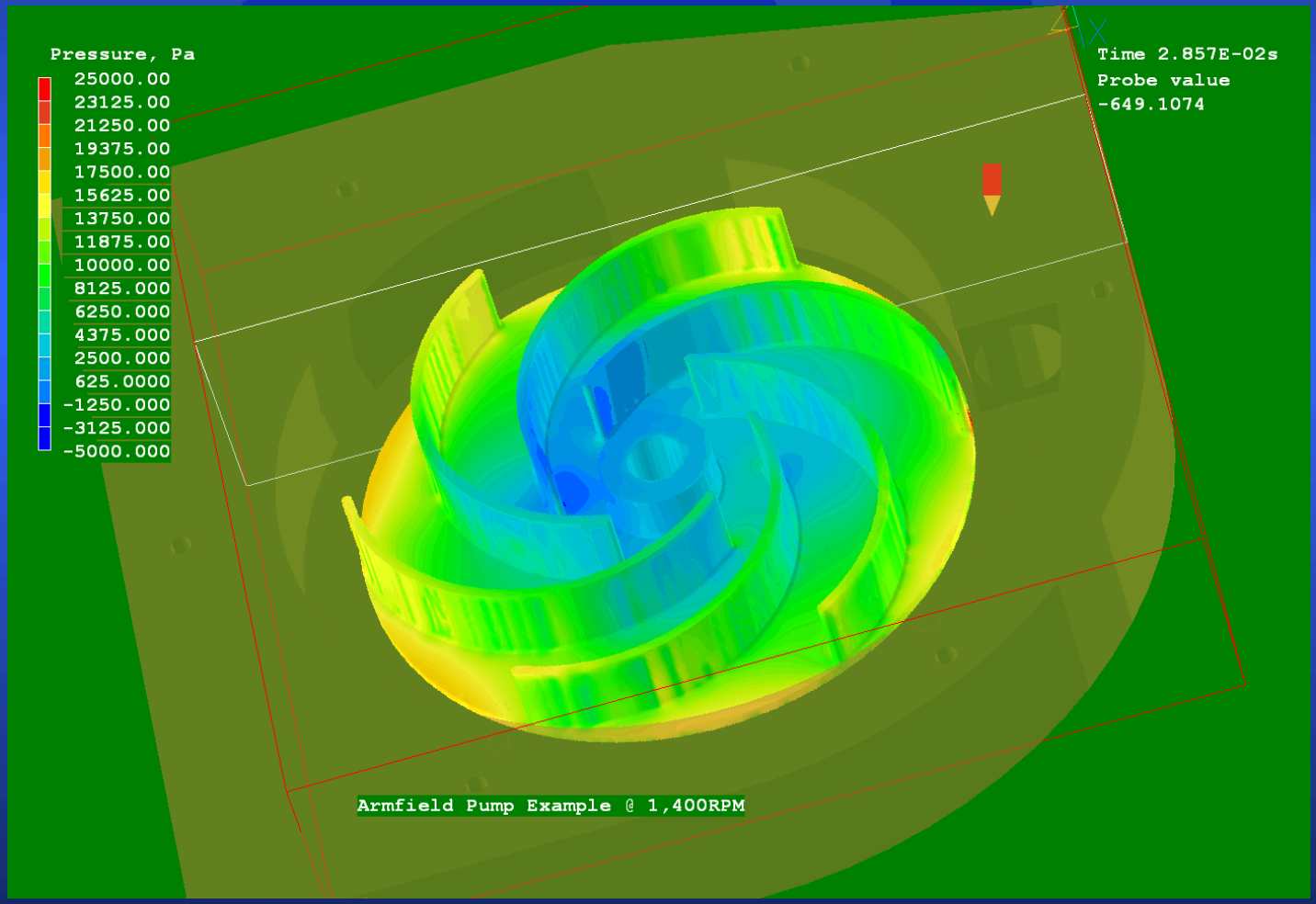



Sectional pressure profile and vectors through and around the impeller.

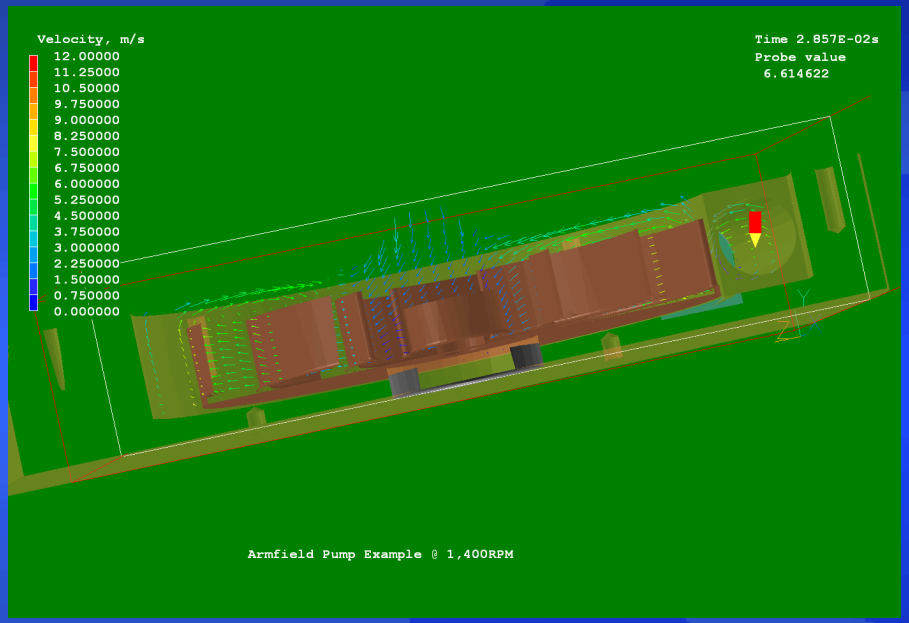


# Results - Pressure

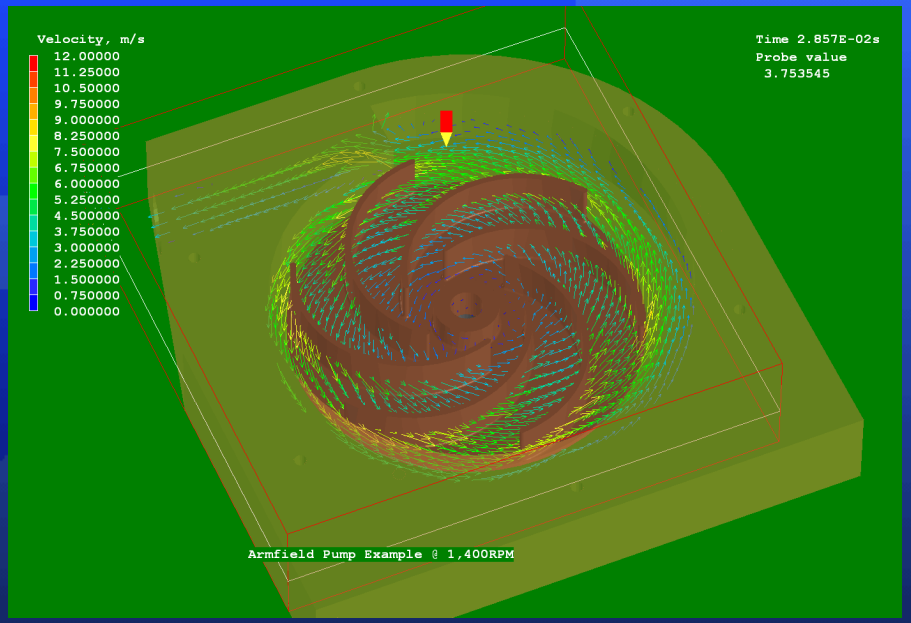
Surface pressure profile on the impeller.



# Results - Velocity

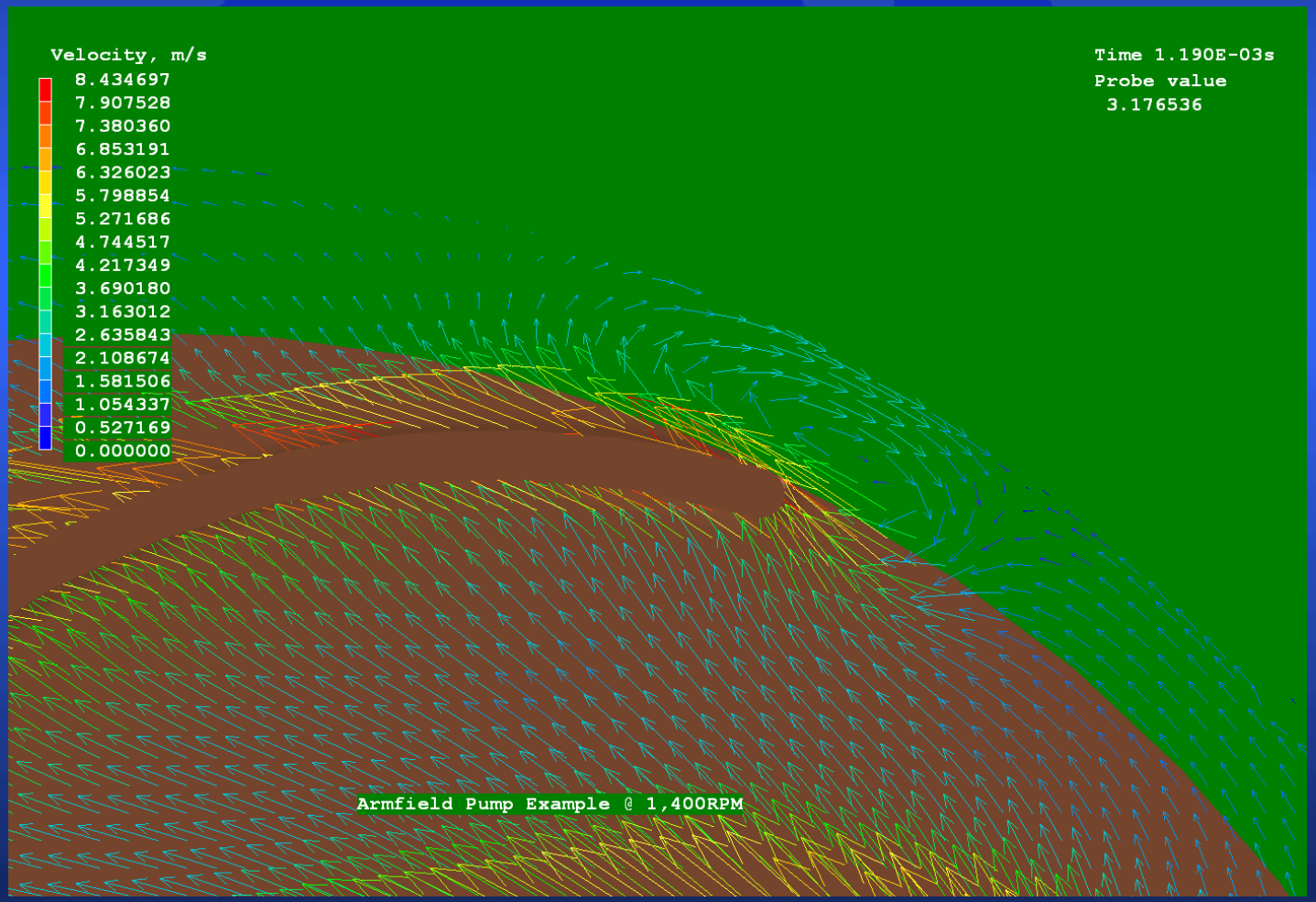



Velocity vectors within the pump, showing use of the 'near-plane' function to view inside the impeller cross section.

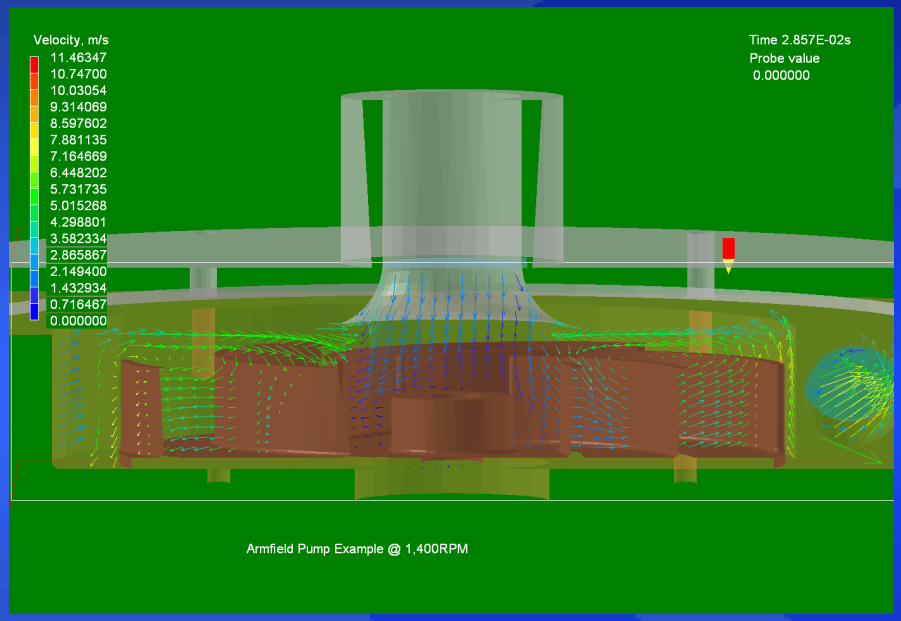


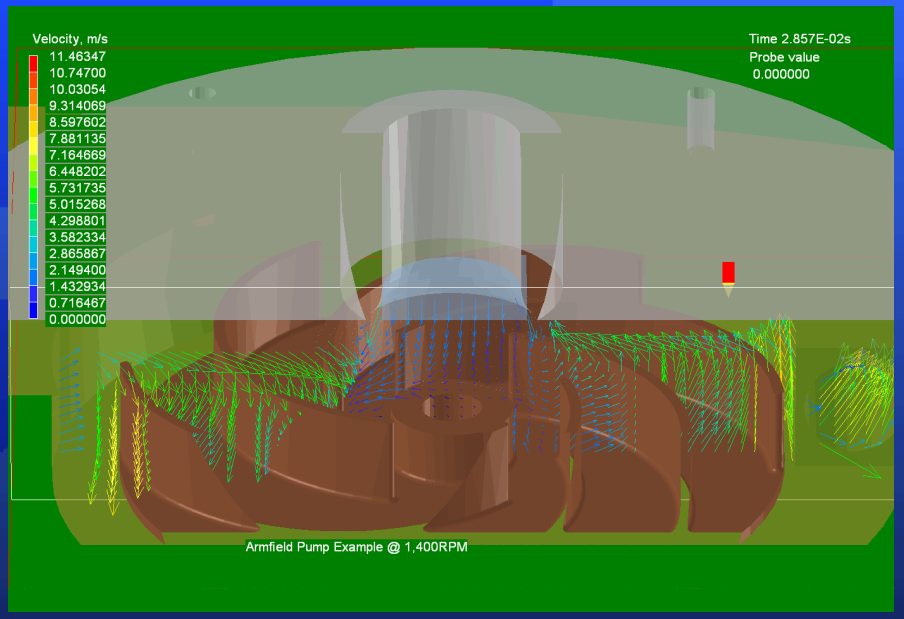
# Results - Velocity

Detailed velocity vectors showing turbulence at the impeller tip.

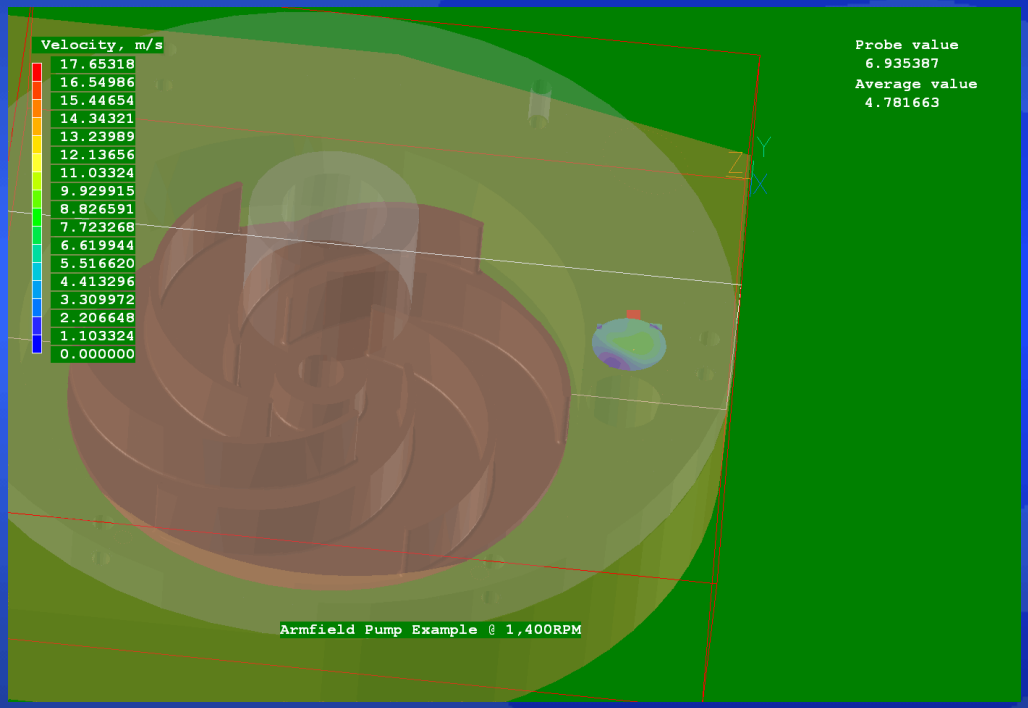


# Results - Velocity



# Results - Calculation




From the geometry supplied the diameter of the outlet appears to be 18mm diameter. Therefore volume flow rate is given by…

Area of outlet = 2.54 E-4 m
Average velocity at outlet = 4.78m/s

Volume flow rate = 0.00122$m^3/s$
Experimental flow rate = 0.001$m^3/s$

# END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