

REDESIGN OF FLOW DISTRIBUTION CHAMBER THROUGH SIMULATION



CONVENTIONAL DISTRIBUTION CHAMBER (WEIR TYPE)

METHODOLOGY IN CFD

PRE -PROCESSING

Geometry generation

Geometry refinement
↓

Meshing

PROCESSING

Problem
Specification

Additional Models
↓

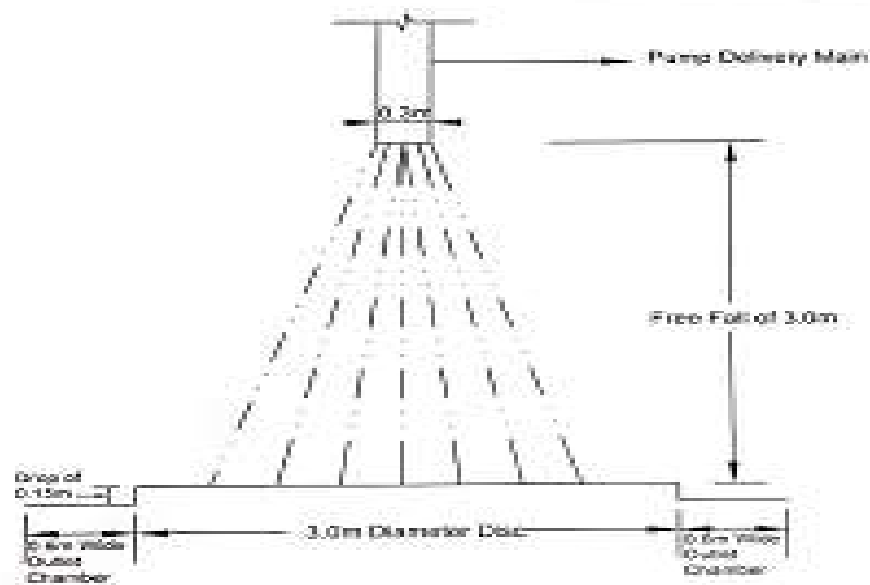
Numerical
Computations

POST-PROCESSING

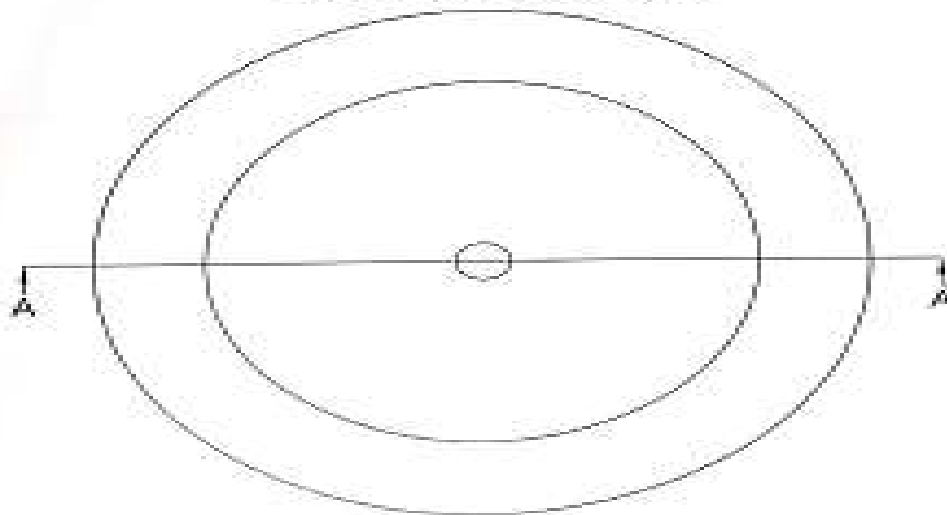
Vector and Contour
Data

Evaluation of Values
↓

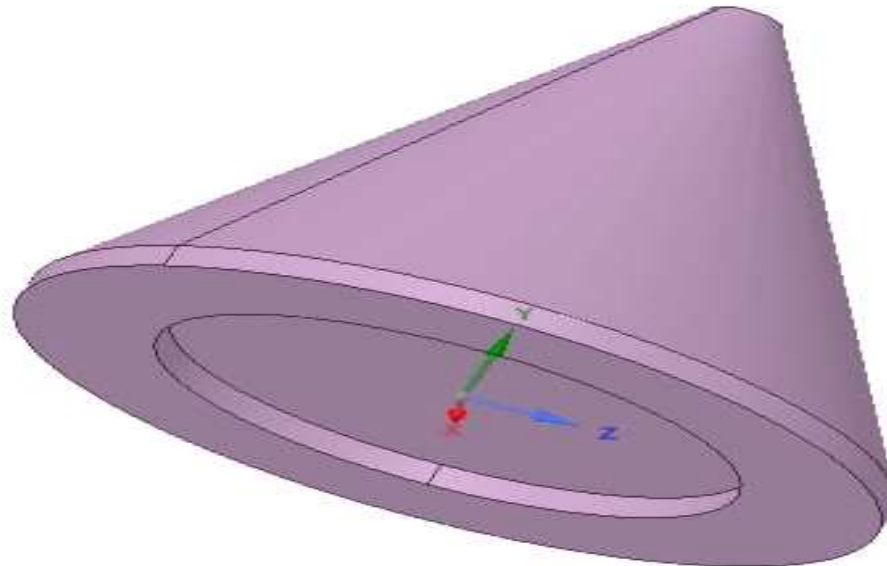
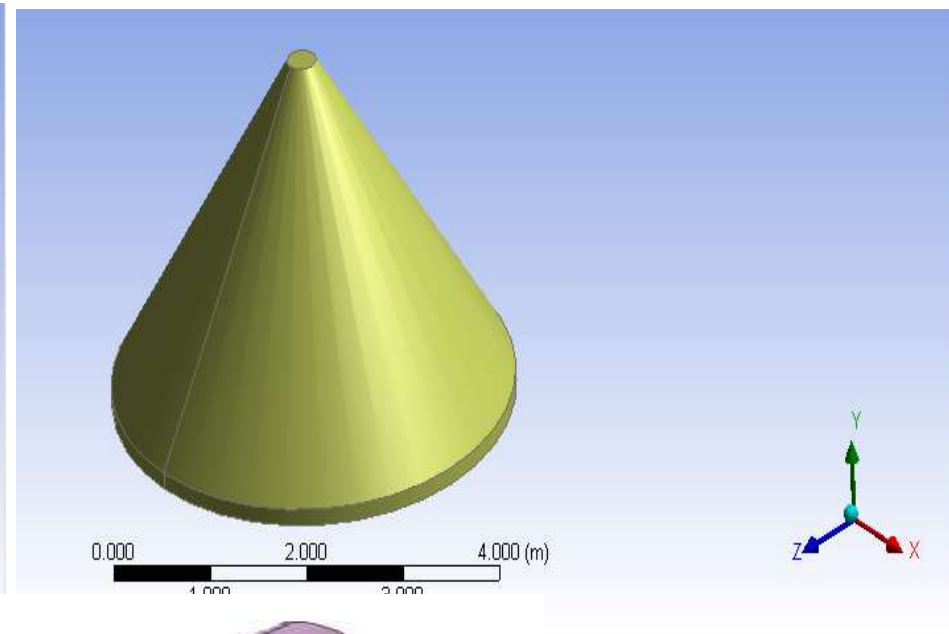
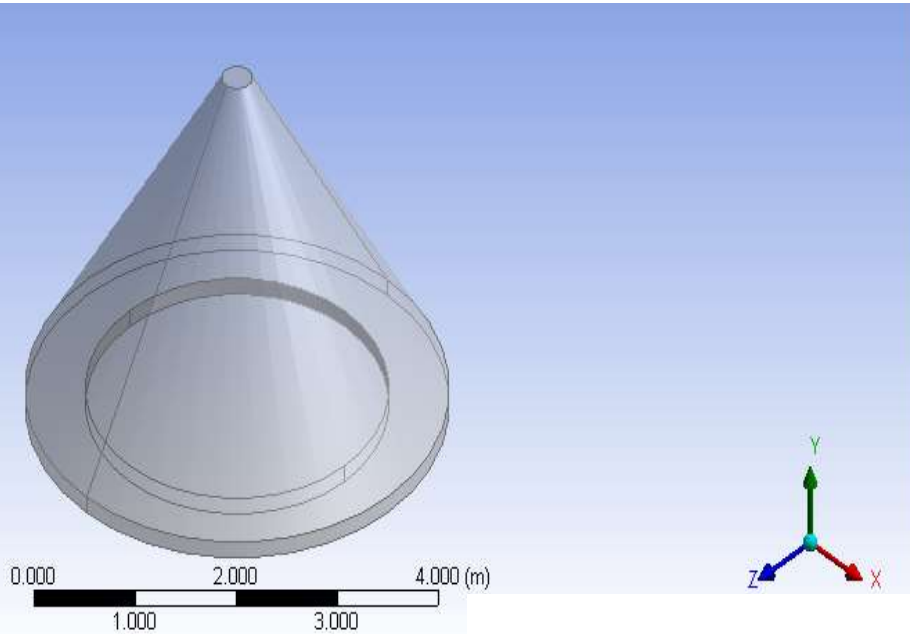
Report Generations



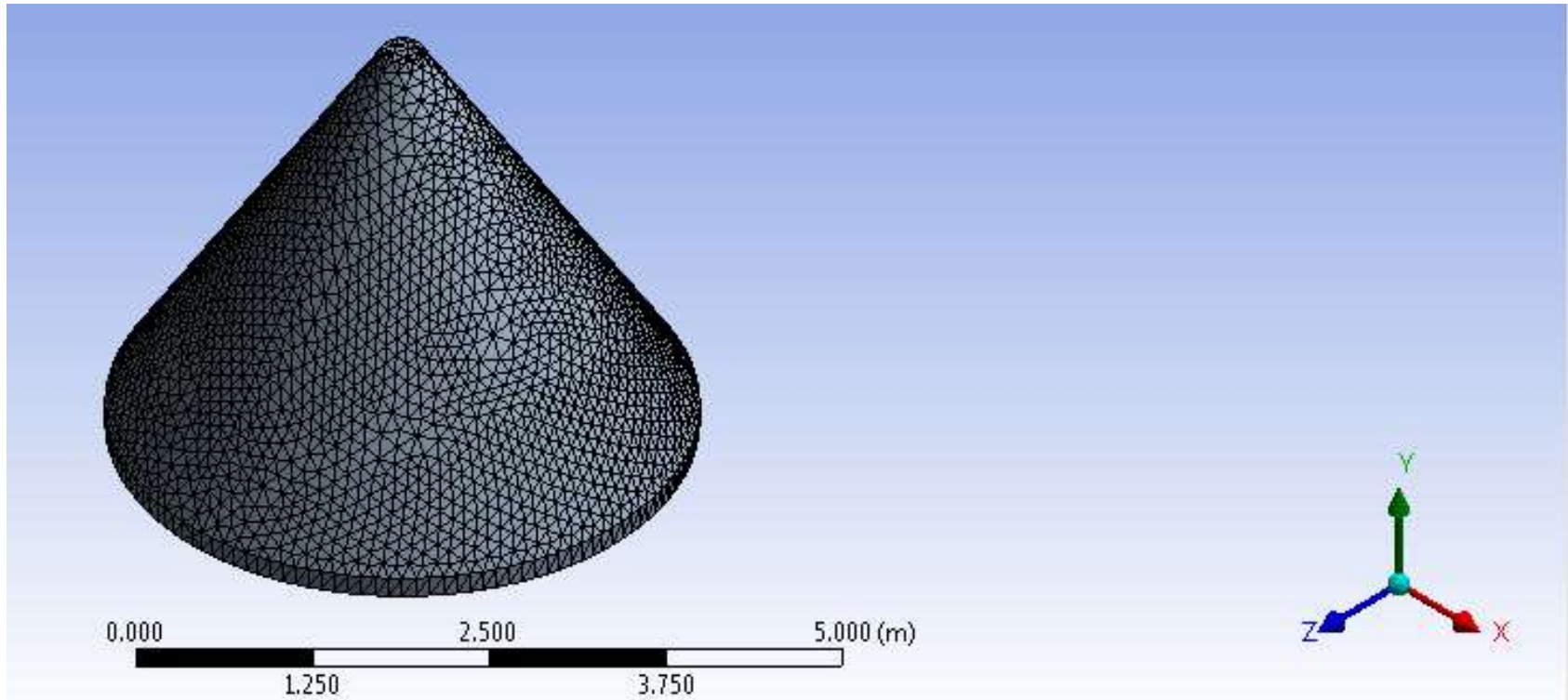
Sectional Elivation at A A'



GEOMETRY OF CIRCULAR DISTRIBUTION CHAMBER

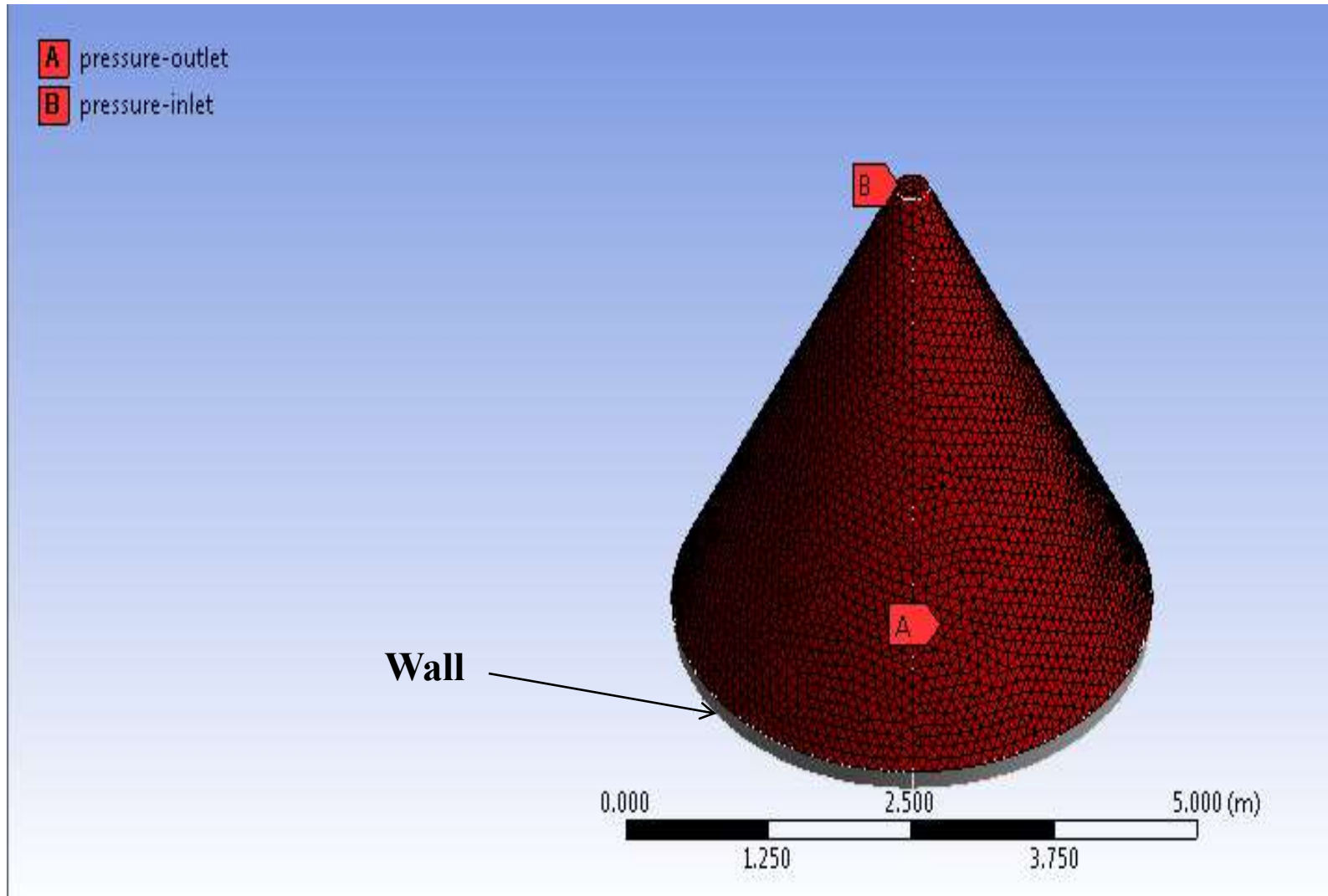


MESHING OF CIRCULAR CHAMBER

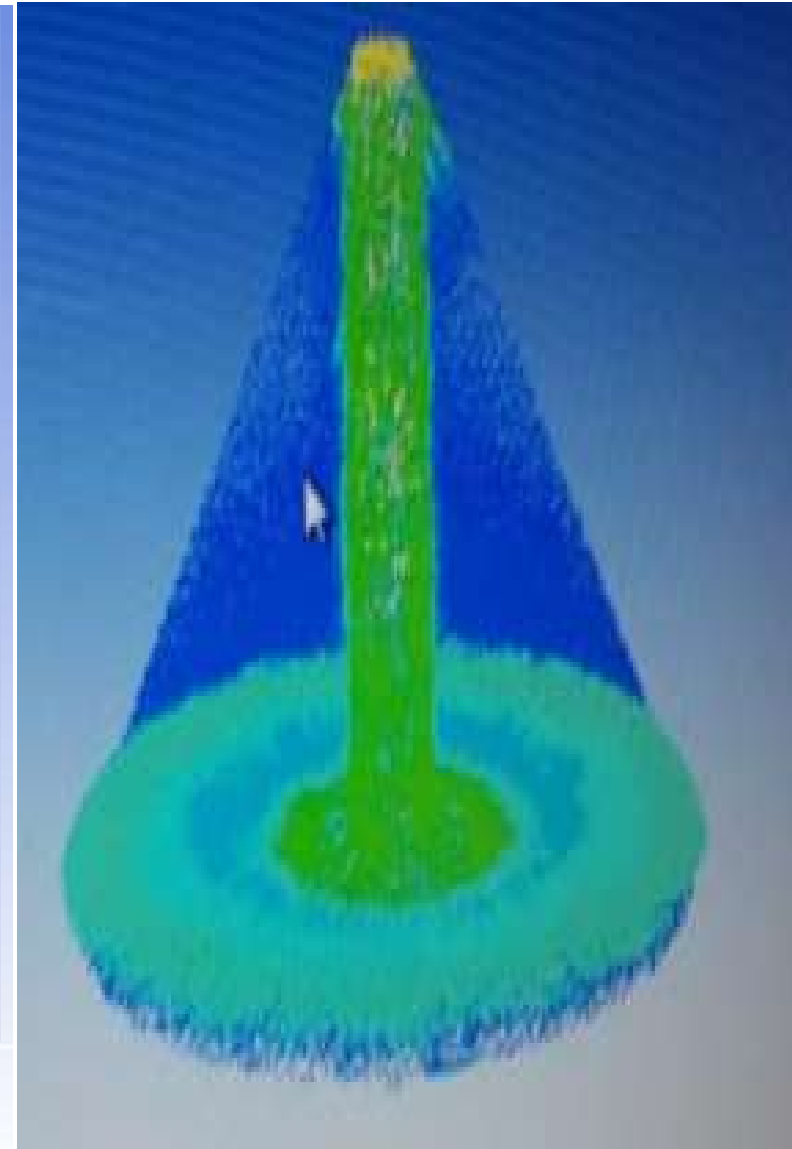
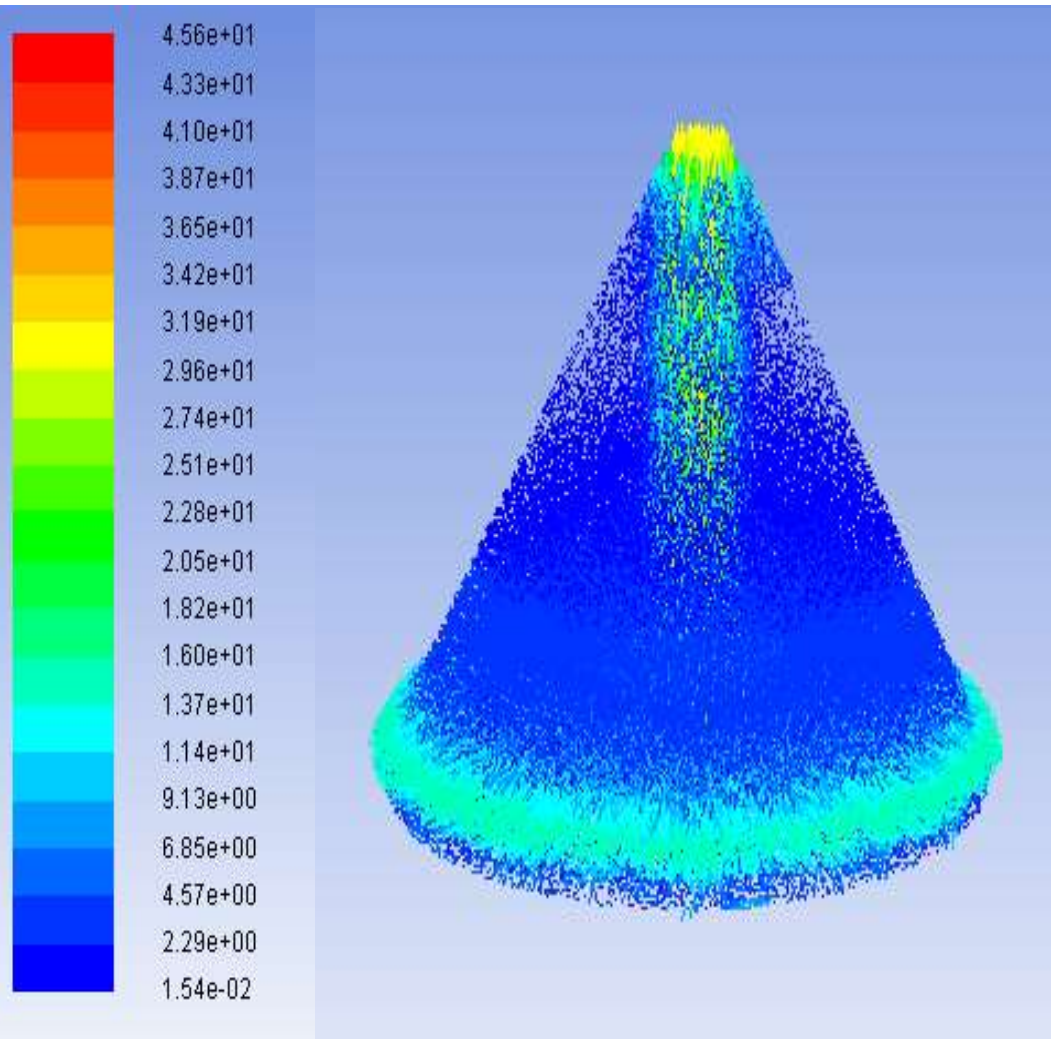


DESCRIPTIONS OF THE ITEM	2.5m DIAMETER DISC	3.0m DIAMETER DISC	3.5m DIAMETER DISC
NODES	1,53,869	1,87,793	2,89,464
ELEMENTS	1,23,566	1, 67,947	2,65,879

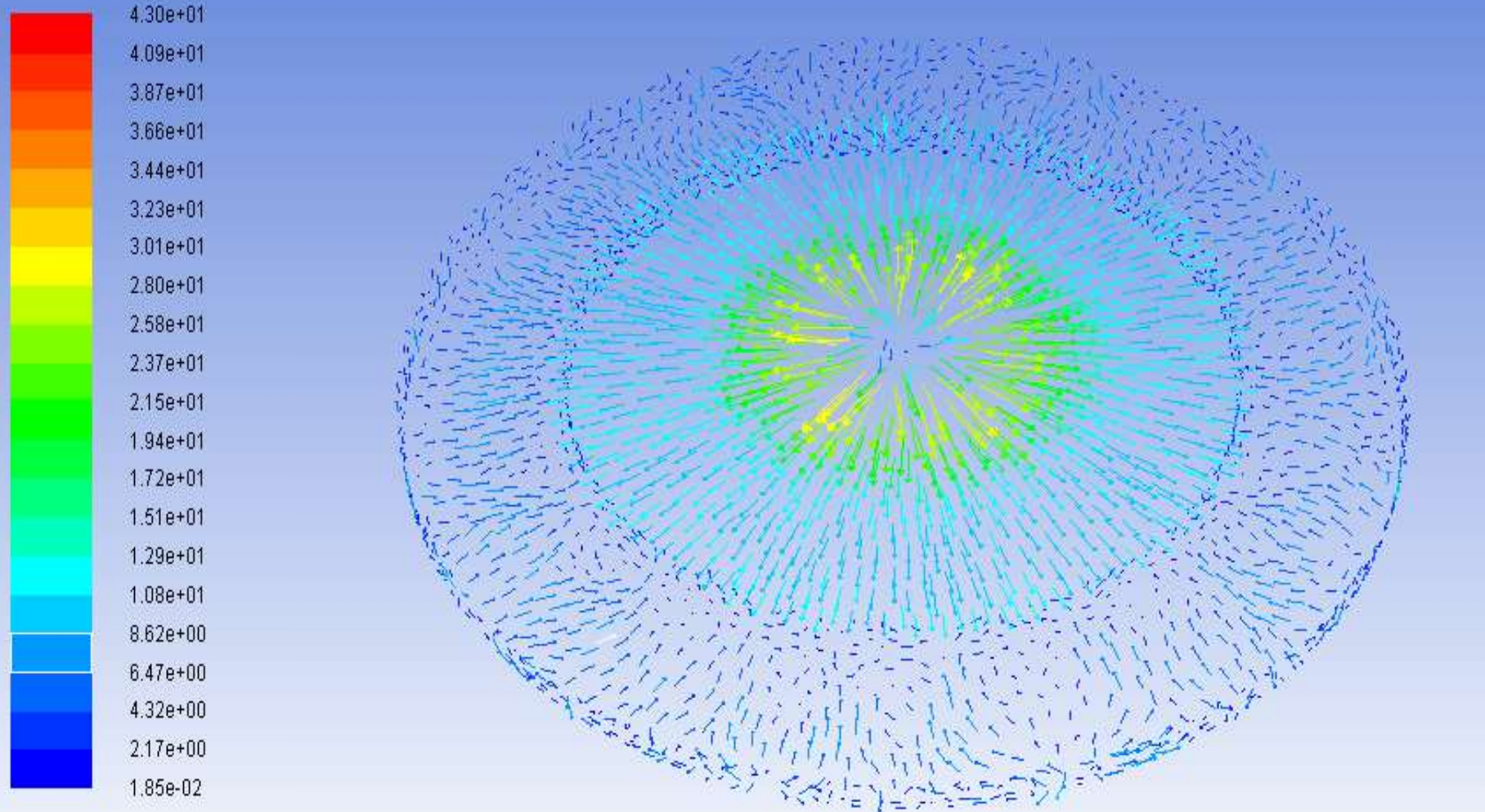
BOUNDARY CONDITIONS OF CIRCULAR CHAMBER



FLOW PROFILE OVER 2.5 M DIAMETER DISC AT A PRESSURE HEAD OF 45.0 M



VELOCITY VECTORS FOR 45.0 M PRESSURE HEAD OVER 2.5 M DISC DIAMETER



Velocity Vectors Colored By Velocity Magnitude (mixture) (m/s) (Time=1.3000e-01)

COMPARATIVE RESULTS OF ANALYSIS

Disc size (m)	FLOW VELOCITY IN THE OUTLET CHANNEL (m/s)				
	Pressure head (45.0m)	Pressure head (15.0m)	Pressure head (7.5m)	Pressure head (5.0m)	Pressure head (4.0m)
3.0	5.52	2.635	1.955	1.655	1.46
3.5	4.60	3.365	2.220	3.29	1.40
2.5	5.71	3.405	2.175	1.56	1.26

**Design Procedure to facilitate the
Practicing Engineers
has been evolved.**

**However, as it had been submitted for a
PATENT it is not disclosed over here.**

CONCLUSIONS

- From the present investigation, it is ascertained that, the simulation models are helpful in forecasting possible flow scenarios even before the execution of the project.
- Certainly, these inputs can be made use of to incorporate appropriate changes in the system either in the planning and/or design stages of the project, even without physical modelling.
- In simulation analysis, the modeler can examine a wide variety of possible situations to decide whether the output is sensible or not.
- Simulation models also help to identify the physical and institutional relationships and interactions that are esoteric and lead to needed research for the benefit of the society.



**THANKS FOR YOUR
PATIENT LISTENING
&
OPEN FOR DISCUSSION**

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