

 Image file not found

Ansys Fluent Simulation Report

Analyst	DELL
Date	12/12/2022 02:27 AM

Table of Contents

[1 System Information](#)

[2 Geometry and Mesh](#)

[2.1 Mesh Size](#)

[2.2 Mesh Quality](#)

[2.3 Orthogonal Quality](#)

[3 Simulation Setup](#)

[3.1 Physics](#)

[3.1.1 Models](#)

[3.1.2 Material Properties](#)

[3.1.3 Cell Zone Conditions](#)

[3.1.4 Boundary Conditions](#)

[3.1.5 Reference Values](#)

[3.2 Solver Settings](#)

[4 Run Information](#)

[5 Solution Status](#)

[6 Report Definitions](#)

[7 Plots](#)

System Information

Application	Fluent
Settings	2d, double precision, pressure-based, laminar, transient
Version	22.2.0-10212
Source Revision	61a5bc1c97
Build Time	May 27 2022 08:53:42 EDT
CPU	11th Gen Intel(R) Core(TM) i5-11300H @ 3.10GHz
OS	Windows

Geometry and Mesh

Mesh Size


Cells	Faces	Nodes
--------------	--------------	--------------

Cells	Faces	Nodes
5664	11106	5442

Mesh Quality

Name	Type	Min Orthogonal Quality	Max Aspect Ratio
surface_body	Mixed Cell	0.069474914	12.525475

Orthogonal Quality

Image file not found

Simulation Setup

Physics

Models

Model	Settings
Space	2D
Time	Unsteady, 2nd-Order Implicit
Viscous	Laminar

Material Properties

— Fluid	
— fluid	
Density	1 kg/m^3
Cp (Specific Heat)	1006.43 J/(kg K)
Thermal Conductivity	0.0242 W/(m K)
Viscosity	1 kg/(m s)
Molecular Weight	28.966 kg/kmol
— Solid	
— aluminum	
Density	2719 kg/m^3
Cp (Specific Heat)	871 J/(kg K)
Thermal Conductivity	202.4 W/(m K)

Cell Zone Conditions

— Fluid	
— surface_body	
Material Name	fluid

Specify source terms?	no
Specify fixed values?	no
Frame Motion?	no
Mesh Motion?	no
Porous zone?	no

Boundary Conditions

— Inlet	
— inlet	
Velocity Specification Method	Magnitude, Normal to Boundary
Reference Frame	Absolute
Velocity Magnitude [m/s]	80
Supersonic/Initial Gauge Pressure [Pa]	0
— Outlet	
— outlet	
Backflow Reference Frame	Absolute
Gauge Pressure [Pa]	0
Pressure Profile Multiplier	1
Backflow Direction Specification Method	Normal to Boundary
Backflow Pressure Specification	Total Pressure
Build artificial walls to prevent reverse flow?	no
Average Pressure Specification?	no
Specify targeted mass flow rate	no
— Wall	
— wall	
Wall Motion	Stationary Wall
Shear Boundary Condition	No Slip
— cylinder	
Wall Motion	Stationary Wall
Shear Boundary Condition	No Slip

Reference Values

Area	1 m^2
Density	1 kg/m^3
Depth	1 m
Enthalpy	0 J/kg
Length	1 m
Pressure	0 Pa
Temperature	288.16 K
Velocity	80 m/s
Viscosity	1 kg/(m s)
Ratio of Specific Heats	1.4
Yplus for Heat Tran. Coef.	300

Solver Settings

— Equations	
Flow	True
— Numerics	
Absolute Velocity Formulation	True
— Unsteady Calculation Parameters	
Number of Time Steps	250
Time Step Size [s]	0.01
Max Iterations/Time Step	50
— Under-Relaxation Factors	
Pressure	0.3
Density	1
Body Forces	1
Momentum	0.7
— Pressure-Velocity Coupling	
Type	SIMPLE
— Discretization Scheme	
Pressure	Second Order
Momentum	Second Order Upwind
— Solution Limits	
Minimum Absolute Pressure [Pa]	1
Maximum Absolute Pressure [Pa]	5e+10
Minimum Temperature [K]	1
Maximum Temperature [K]	5000

Run Information

Number of Machines	1
Number of Cores	2
Case Read	3.35 seconds
Iteration	111.941 seconds
AMG	42.597 seconds
Virtual Current Memory	0.0511551 GB
Virtual Peak Memory	0.773453 GB
Memory Per M Cell	6.88585

Solution Status

Flow Time: 2.5
Time Step: 250

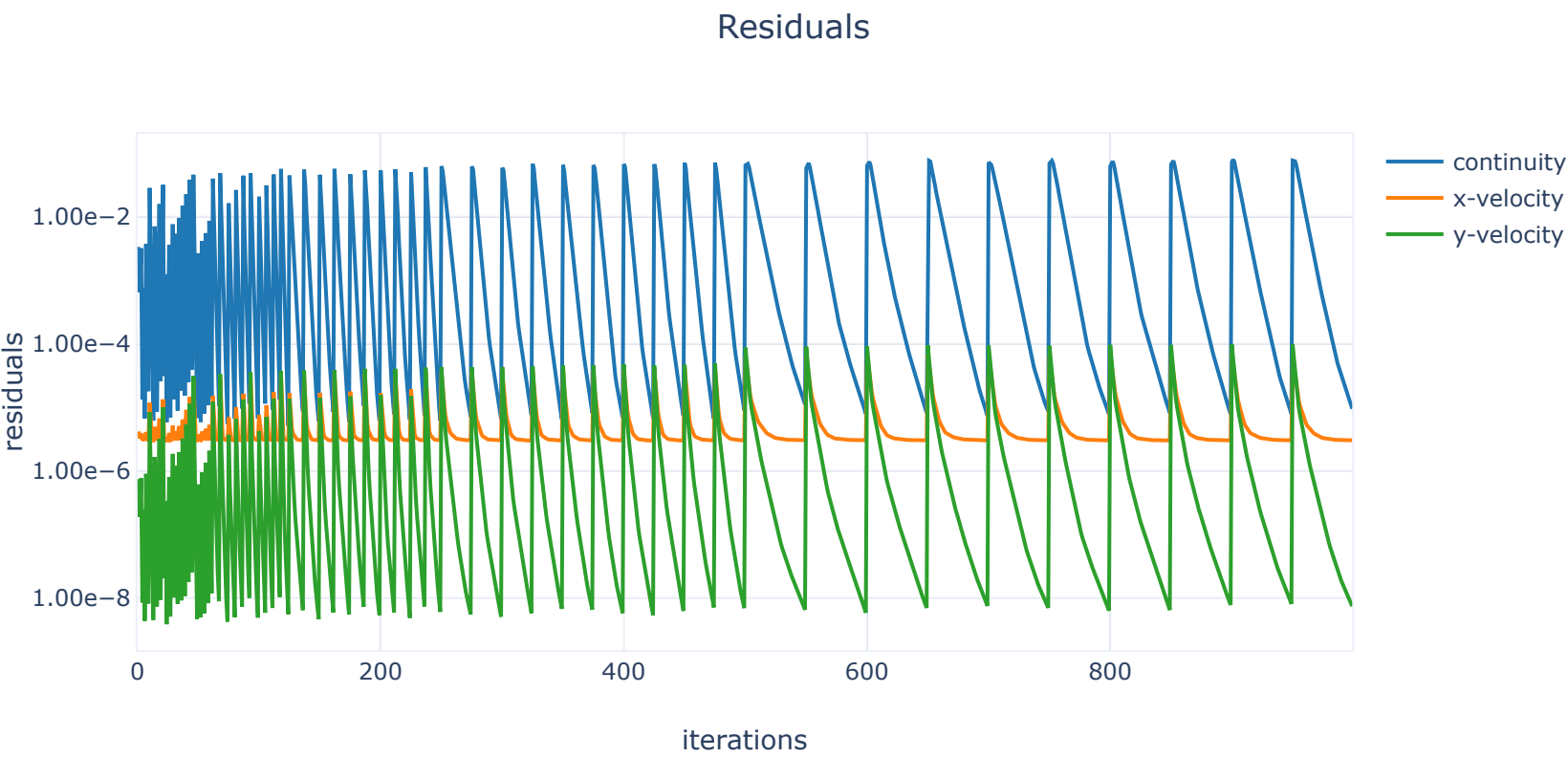
	Value	Absolute Criteria	Convergence Status
continuity	9.508676e-06	1e-06	Not Converged
x-velocity	3.024303e-06	1e-06	Not Converged
y-velocity	7.391315e-09	1e-06	Converged

Report Definitions

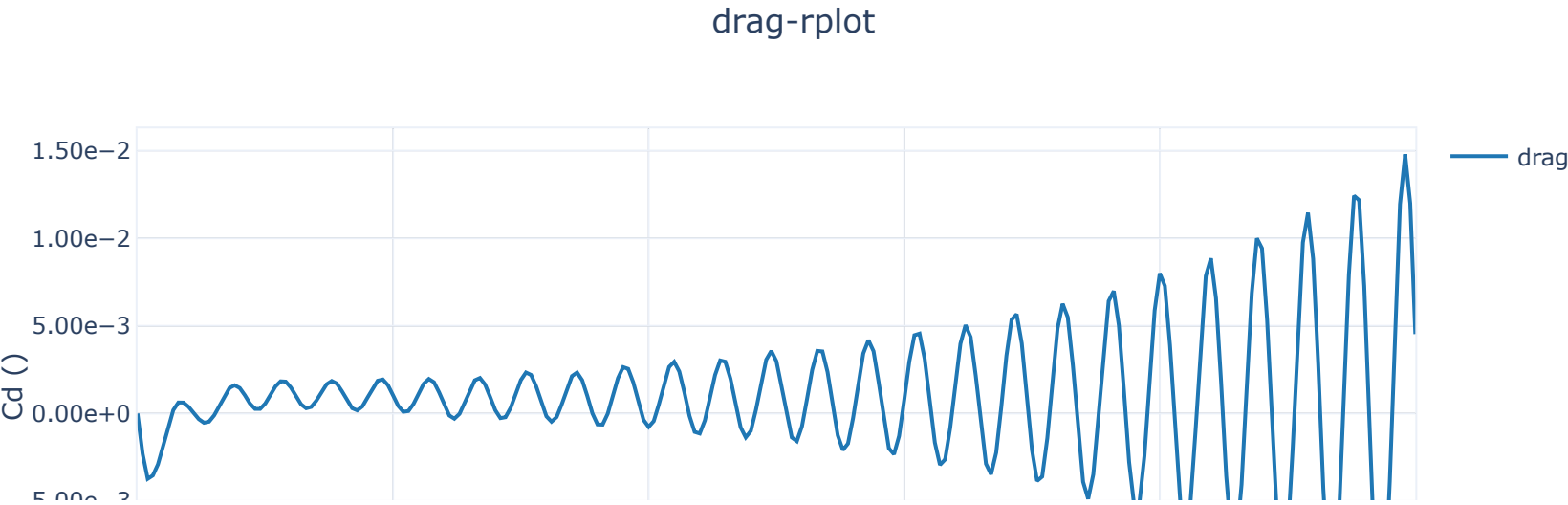
lift	0.00453069	
drag	0.00453069	
delta-time	0.01	s
iters-per-timestep	50	
flow-time	2.5	s

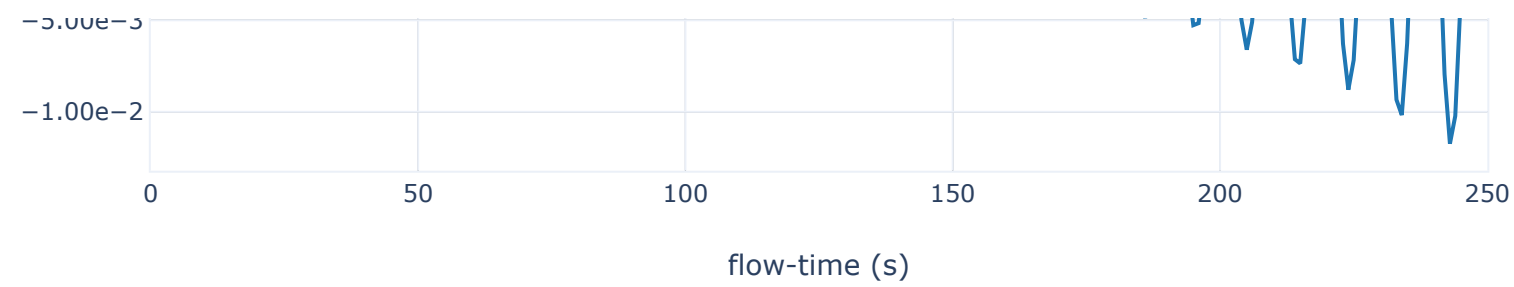
Plots

Residuals



drag-rplot





lift-rplot

