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input3d.dat

MAIN INPUT DATA FILE : 2D HEAT-DRIVEN CAVITY FLOW

DIMENSIONLESS FORM :

	Ra= 1.D+04
density)	Density scale : rho_0 (fluid
cavity	Length scale H : height of
(k/H).Ra**0.25 (k thermal diffusivity)	Velocity scale ---> U0=
hot ; Tc= T cold)	Temperature scale Th - Tc (Th= T
U/U0	Dimensionless Velocity U*=
(T-Tc)/(Th-Tc)	Dimensionless Temperature T*=
viscosity= Pr/Ra**0.5	dimensionless kinematic
diffusivity= 1/Ra**0.5	dimensionless thermal
= Pr.T*	dimensionless buoyancy term
Ly/H= 1	dimensionless domain Lx/H= 1 ,

Q0= 0 (adiabatic)



Q0= 0 (adiabatic)

J  
|  
|  
|  
----> I

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GENERAL LAYOUT
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&Version File_Version="VERSION2.0"/

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                FLUID PROPERTIES
            (DIMENSIONLESS FORM)

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&Fluid_Properties  Heat_Transfer_Flow = .true.  ,  Reference_Density=
1.0,
                Reference_Temperature= 1.0      ,
Reference_Dynamic_Viscosity= 0.71D-02  ,
                Prandtl = 0.71                ,
Thermal_Expansion_Coefficient= 1.0 /

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                UNIFORM INITIALIZATION OF THE VELOCITY COMPONENTS AND TEMPERATURE
            (DIMENSIONLESS FORM)

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&Velocity_Initialization I_Velocity_Reference_Value      = 0.0  ,
J_Velocity_Reference_Value      = 0.0  , K_Velocity_Reference_Value
= 0.0 /
&Temperature_Initialization Temperature_Reference_Value      = 0.5 /

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                GRAVITY
            (DIMENSIONLESS FORM)

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&Gravity  Gravity_Enabled= .true.  , Gravity_Angle_IJ= 90.0  ,
Gravity_Angle_IK= 90.0  , Reference_Gravity_Constant= 0.71/

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                DOMAIN FEATURES

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&Domain_Features Start_Coordinate_I_Direction= 0.00  ,
End_Coordinate_I_Direction= 1.00,
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        Start_Coordinate_J_Direction= 0.00 ,
End_Coordinate_J_Direction= 1.00,
        Start_Coordinate_K_Direction= 0.00 ,
End_Coordinate_K_Direction= 0.00,
        Cells_Number_I_Direction= 64
,Cells_Number_J_Direction=64 ,Cells_Number_K_Direction= 1,
        Regular_Mesh= .true. /

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DEFINITION OF BOUNDARY CONDITIONS
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WALL BOUNDARY CONDITION SETUP
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Keep in mind that the domain is enclosed by default.
No new boundary conditions are defined at the ends of the domain : the
walls by default are preserved

&Heat_Wall_Boundary_Condition_Setup
    Wall_BC_DataSetName ="Set1",
    West_Heat_BC_Option = 0    , East_Heat_BC_Option = 0    ,
Back_Heat_BC_Option = 1    , Front_Heat_BC_Option = 1    ,
South_Heat_BC_Option = 0    , North_Heat_BC_Option = 0    ,
    West_Wall_BC_Value= 1.0    , East_Wall_BC_Value= 0.0    ,
Back_Wall_BC_Value= 0.0    , Front_Wall_BC_Value= 0.0    ,
South_Wall_BC_Value= 0.0    , North_Wall_BC_Value= 0.0 /

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BORDER BOUNDARY CONDITIONS : The walls located by default at the ends
of the domain remain unchanged
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!--- No new boundary conditions are defined at the ends of the domain :
walls by default are preserved, the inlet and outlet previously are
defined above)
!--- As "None" is the default setting for this namelist, it can be
removed

&Border_Domain_Boundary_Conditions West_BC_Name= "None" , East_BC_Name=
"None" , Back_BC_Name= "None" , Front_BC_Name= "None" , North_BC_Name=
"None" , South_BC_Name= "None" /
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NUMERICAL METHODS
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&Numerical_Methods  NS_NumericalMethod= "BDF2-Scheme02"
,      !--- BDF2 + 2nd order centered scheme
      MomentumConvection_Scheme="Centered-02-
Conservative"      ,      !--- conservative form for solving the velocity
(momentum) equation
      Poisson_NumericalMethod="Home-SORMultigrid-
ConstantMatrixCoef" / !--- SOR + multigrid method (homemade release)
for solving the Poisson's equation with constant coefficient matrix

&HomeData_PoissonSolver  SolverName="SOR"      ,      !---
Successive Over-Relaxation (SOR) method based on the red-black
algorithm
      Relaxation_Coefficient= 1.7 ,      !---
Relaxation coefficient of the SOR method ( 1 <= Relaxation_Coefficient
< 2)
      Number_max_Grid= 5,      !---
Number of grid levels
      Number_max_Cycle= 10,      !---
Number of multigrid cycles
      Number_Iteration= 0,      !---
Maximum number of SOR iterations method applied for any grid level, if
0 (or removed) the 3 next data are considered
      Number_Iteration_FineToCoarseGrid= 3, !---
number of SOR iterations applied on any grid level during the
restriction step (before the coarsest grid computation)
      Number_Iteration_CoarseToFineGrid= 15, !---
number of SOR iterations applied on any grid level during the
prolongation step (after the Coarsest grid computation)
      Number_Iteration_CoarsestGrid= 15 ,      !---
number of SOR iterations applied on the coarsest grid
      Convergence_Criterion= 1.D-08 /      !---
convergence tolerance on the residu of the Poisson's equation

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SIMULATION MANAGEMENT
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The numerical time step is estimated by means of the CFL coefficient

&Simulation_Management  Restart_Parameter= 0 ,
      Steady_Flow_Stopping_Criterion_Enabled =
.true. , Steady_Flow_Stopping_Criterion = 1.D-16,
      Temporal_Iterations_Number = 1000000
, Final_Time = 5.D+02 ,
      TimeStep_Type = 1 ,
      Timestep_Min = 1.D-02
, Timestep_Max = 1.D-02 ,
      CFL_Min      = 0.5

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, CFL_Max      = 0.5 ,
                                Iterations_For_Timestep_Linear_Progress= 1,
                                Simulation_Backup_Rate      =
1000    , Simulation_Checking_Rate = 101 /

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PROBES MANAGEMENT
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    NO PROBE

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FIELDS RECORDING DECLARATION
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&Simulation_Management  Fields_Recording_Rate = 5.D+01 /
&Field_Recording_Setup   Check_Special_Features=
"Heat_Driven_Cavity_Flow", Precision_On_Instantaneous_Fields= 2 /
Here, a special variable devoted to results of heat driven cavity flows
is active

&Instantaneous_Fields_Listing  Name_of_Field = "U      " ,
Recording_Enabled = .true. /      First velocity component
&Instantaneous_Fields_Listing  Name_of_Field = "V      " ,
Recording_Enabled = .true. /      Second velocity component
&Instantaneous_Fields_Listing  Name_of_Field = "T      " ,
Recording_Enabled = .true. /      Temperature

END OF FILE
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