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input3d.dat

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====
MAIN INPUT DATA FILE : 2D RAYLEIGH-BENARD CONFIGURATION
DIMENSIONLESS FORMULATION

      ----- Top wall (T_2)
      |
H  |  <----- Symmetric BC ----->  |
      |
      |
      |
      |
      ----- Bottom wall (T_1)

      <----->
              2.H

Reference Temperature = (T_1+T_2)/2

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GENERAL LAYOUT
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+++++
&Version File_Version="VERSION2.0"/
=====
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FLUID PROPERTIES
(DIMENSIONLESS FORM)
=====
====
&Fluid_Properties Heat_Transfer_Flow = .true. , Reference_Density=
1.0, Reference_Heat_Capacity= 1.0 ,
Reference_Temperature= 0.5 ,
Reference_Dynamic_Viscosity= 1.8D-02 ,
Prandtl = 0.72 /
=====
====
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 ,
White_Noise_Magnitude_For_Temperature= 0.00/
=====
====

                GRAVITY
            (DIMENSIONLESS FORM)
=====
====

&Gravity Gravity_Enabled= .true. , Gravity_Angle_IJ= 90.0 ,
Gravity_Angle_IK= 90.0 , Reference_Gravity_Constant= 0.72/
=====
====

                DOMAIN FEATURES
=====
====

&Domain_Features Start_Coordinate_I_Direction= 0.00 ,
End_Coordinate_I_Direction= 2.00,
                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= 128
,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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&Heat_Wall_Boundary_Condition_Setup
    West_Heat_BC_Option = 1 , East_Heat_BC_Option = 1 ,
    Back_Heat_BC_Option = 0 , Front_Heat_BC_Option = 0 ,
    South_Heat_BC_Option = 0 , North_Heat_BC_Option = 0,
    West_Wall_BC_Value= 0.0 , East_Wall_BC_Value= 0.0 ,
    Back_Wall_BC_Value= 1.0 , Front_Wall_BC_Value= 0.0 ,
    South_Wall_BC_Value= 0.0 , North_Wall_BC_Value= 0.0 /
=====
=====

                BORDER BOUNDARY CONDITIONS
=====
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```

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&Border_Domain_Boundary_Conditions West_BC_Name= "Symmetric" ,
East_BC_Name= "Symmetric" , Back_BC_Name= "None" , Front_BC_Name=
"None" , North_BC_Name= "None" , South_BC_Name= "None" /
+++++
NUMERICAL METHODS
+++++
&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= 4,      !---
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= 15, !---
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
+++++
SIMULATION MANAGEMENT
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The numerical time step is dynamic and is estimated by the constant 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 = 0 ,
                                Timestep_Min = 5.D-02
, Timestep_Max = 5.D-02 ,
                                CFL_Max = 0.5 ,
                                Simulation_Backup_Rate = 1000
, Simulation_Checking_Rate = 101 /
=====
=====
                                PROBES MANAGEMENT
=====
=====
                                Probes order    U
, V      , W      , T      , P      , RH0
&Probe_Quantities_Enabled Temporal_Series_For_Quantity_Enabled(:) =
.true., .true., .false., .true., .true. , .false. /
&Probe_Location Xi= 0.5 , Xj= 0.7 , Xk= 0.0 /
&Simulation_Management   Probe_RecordingReset=.false. ,
    Probe_StartTimeIterationRecording= 0 , !--- in time-
iteration units
    Probe_TimeIterationRecordingRate = 1 !--- in time-
iteration units
    /
=====
=====
                                FIELDS RECORDING DECLARATION
=====
=====
&Simulation_Management Fields_Recording_Rate = 1.D+01 /
&Field_Recording_Setup Precision_On_Instantaneous_Fields= 2 /

&Instantaneous_Fields_Listing Name_of_Field = "U      " /      First
velocity component
&Instantaneous_Fields_Listing Name_of_Field = "V      " /      Second
velocity component
&Instantaneous_Fields_Listing Name_of_Field = "T      " /
Temperature
```

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Last update: **2020/02/10 11:38**

