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<?xml version="1.0" encoding="utf-8" ?>
<NEKTAR>
<EXPANSIONS>
    <E COMPOSITE="C[0]" BASISATYPE="Modified_A,Modified_A,Modified_B" NUMMODES="5,5,5"
POINTSTYPE="GaussLobattoLegendre,GaussLobattoLegendre,GaussRadauMAlpha1Beta0"
NUMPOINTS="7,7,6" FIELDS="u,v,w" />
    <E COMPOSITE="C[0]" BASISATYPE="Modified_A,Modified_A,Modified_B" NUMMODES="4,4,4"
POINTSTYPE="GaussLobattoLegendre,GaussLobattoLegendre,GaussRadauMAlpha1Beta0"
NUMPOINTS="7,7,6" FIELDS="p" />
    <E COMPOSITE="C[2]" BASISATYPE="Modified_A,Modified_B,Modified_C" NUMMODES="5,5,5"
POINTSTYPE="GaussLobattoLegendre,GaussRadauMAlpha1Beta0,GaussRadauMAlpha2Beta0"
NUMPOINTS="7,6,6" FIELDS="u,v,w" />
    <E COMPOSITE="C[2]" BASISATYPE="Modified_A,Modified_B,Modified_C" NUMMODES="4,4,4"
POINTSTYPE="GaussLobattoLegendre,GaussRadauMAlpha1Beta0,GaussRadauMAlpha2Beta0"
NUMPOINTS="7,6,6" FIELDS="p" />
</EXPANSIONS>
<CONDITIONS>
<SOLVERINFO>
    <I PROPERTY="SolverType" VALUE="VelocityCorrectionScheme"/>
    <I PROPERTY="EQTYPE" VALUE="UnsteadyNavierStokes"/>
    <I PROPERTY="EvolutionOperator" VALUE="Nonlinear"/>
    <I PROPERTY="Projection" VALUE="Continuous"/>
    <I PROPERTY="GlobalSysSoln" VALUE="IterativeStaticCond"/>
    <I PROPERTY="SuccessiveRHS" VALUE="-10"/>
    <I PROPERTY="TimeIntegrationMethod" VALUE="IMEXOrder2"/>
    <I PROPERTY="Driver" VALUE="Standard"/>
    <I PROPERTY="SPECTRALHPDEALIASING" VALUE="True"/>
    <I PROPERTY="CheckAbortFile" VALUE="ABORT"/>
    <I PROPERTY="CheckAbortStep" VALUE="10"/>
    <I PROPERTY="LinearPreconSolver" VALUE="Xxt"/>
    <I PROPERTY="SpectralVanishingViscosity" VALUE="DGKernel"/>
</SOLVERINFO>
<PARAMETERS>
    <P> IO_InfoSteps = 10 </P>
    <P> TimeStep = 1e-05 </P>
    <P> StepsPerCTU = 25000 </P>
    <P> NumSteps = 5*StepsPerCTU </P>
    <P> IO_CheckSteps = 0.5*StepsPerCTU </P>
    <P> IO_CFLSteps = 10 </P>
    <P> Kinvis = 1.448e-06 </P>
    <P> SVVDiffCoeff = 0.4 </P>
    <P> SVVCutoffRatio = 0.25 </P>
</PARAMETERS>
<VARIABLES>
    <V ID="0"> u</V>

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<V ID="1"> v</V>
<V ID="2"> w</V>
<V ID="3"> p</V>
</VARIABLES>

<GLOBALSYSSOLNINFO>
  <V VAR="u">
    <I PROPERTY="GlobalSysSoln" VALUE="IterativeStaticCond"/>
    <I PROPERTY="Preconditioner" VALUE="LowEnergyBlock"/>
    <I PROPERTY="IterativeSolverTolerance" VALUE="1e-02"/>
    <I PROPERTY="AbsoluteTolerance" VALUE="True"/>
  </V>
  <V VAR="v">
    <I PROPERTY="GlobalSysSoln" VALUE="IterativeStaticCond"/>
    <I PROPERTY="Preconditioner" VALUE="LowEnergyBlock"/>
    <I PROPERTY="IterativeSolverTolerance" VALUE="1e-02"/>
    <I PROPERTY="AbsoluteTolerance" VALUE="True"/>
  </V>
  <V VAR="w">
    <I PROPERTY="GlobalSysSoln" VALUE="IterativeStaticCond"/>
    <I PROPERTY="Preconditioner" VALUE="LowEnergyBlock"/>
    <I PROPERTY="IterativeSolverTolerance" VALUE="1e-02"/>
    <I PROPERTY="AbsoluteTolerance" VALUE="True"/>
  </V>
  <V VAR="p">
    <I PROPERTY="GlobalSysSoln" VALUE="IterativeStaticCond"/>
    <I PROPERTY="Preconditioner" VALUE="Diagonal"/>
    <I PROPERTY="IterativeSolverTolerance" VALUE="1e-04"/>
    <I PROPERTY="AbsoluteTolerance" VALUE="True"/>
    <I PROPERTY="NekLinSysMaxIterations" VALUE="10000" />
  </V>
</GLOBALSYSSOLNINFO>

<BOUNDARYREGIONS>
<B ID ="0"> C[5]</B>
<B ID ="1"> C[6]</B>
<B ID ="2"> C[7]</B>
<B ID ="3"> C[8]</B>
<B ID ="4"> C[9]</B>
<B ID ="5"> C[14]</B>
<B ID ="6"> C[15]</B>
<B ID ="7"> C[10]</B>
<B ID ="8"> C[11]</B>
<B ID ="9"> C[13]</B>
<B ID ="10"> C[3]</B>
<B ID ="11"> C[4]</B>
<B ID ="12"> C[12]</B>

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<B ID ="13"> C[17]</B>
<B ID ="14"> C[18]</B>
<B ID ="15"> C[16]</B>
</BOUNDARYREGIONS>

<BOUNDARYCONDITIONS>
  <REGION REF="0"> <!-- LFW_fia_mp -->
    <D VAR="u" VALUE="0" />
    <D VAR="v" VALUE="0" />
    <D VAR="w" VALUE="0" />
    <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
  </REGION>

  <REGION REF="1"> <!-- LFW_element_1 -->
    <D VAR="u" VALUE="0" />
    <D VAR="v" VALUE="0" />
    <D VAR="w" VALUE="0" />
    <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
  </REGION>

  <REGION REF="2"> <!-- LFW_element_2 -->
    <D VAR="u" VALUE="0" />
    <D VAR="v" VALUE="0" />
    <D VAR="w" VALUE="0" />
    <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
  </REGION>

  <REGION REF="3"> <!-- LFW_element_4 -->
    <D VAR="u" VALUE="0" />
    <D VAR="v" VALUE="0" />
    <D VAR="w" VALUE="0" />
    <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
  </REGION>

  <REGION REF="4"> <!-- LFW_endplate -->
    <D VAR="u" VALUE="0" />
    <D VAR="v" VALUE="0" />
    <D VAR="w" VALUE="0" />
    <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
  </REGION>

  <REGION REF="5"> <!-- LNB_nosebox -->
    <D VAR="u" VALUE="0" />
    <D VAR="v" VALUE="0" />
    <D VAR="w" VALUE="0" />
    <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
  </REGION>
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<REGION REF="6"> <!-- LNB_hanger -->
  <D VAR="u" VALUE="0" />
  <D VAR="v" VALUE="0" />
  <D VAR="w" VALUE="0" />
  <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
</REGION>

<REGION REF="7"> <!-- LWF_tyre_main -->
  <D VAR="u" USERDEFINEDTYPE="ZeroNormalComponent" VALUE="3.0444*(-
0.9990482213319669*(z-0.285304259701)-0.043611435835778804*(y+0.7120866253020001))" />
  <D VAR="v" USERDEFINEDTYPE="ZeroNormalComponent" VALUE="-3.0444*(-
0.0008328123352155331*(z-0.285304259701)-0.043611435835778804*(x-0.045297847557))" />
  <D VAR="w" USERDEFINEDTYPE="ZeroNormalComponent" VALUE="3.0444*(-
0.0008328123352155331*(y+0.7120866253020001)+0.9990482213319669*(x-0.045297847557))" />
  <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
</REGION>

<REGION REF="8"> <!-- LWF_tyre_cp_rotating -->
  <D VAR="u" VALUE="1.0" />
  <D VAR="v" VALUE="0.0" />
  <D VAR="w" VALUE="0.0" />
  <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
</REGION>

<REGION REF="9"> <!-- WT_floor -->
  <D VAR="u" VALUE="1.0" />
  <D VAR="v" VALUE="0.0" />
  <D VAR="w" VALUE="0.0" />
  <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
</REGION>

<REGION REF="10"> <!-- WT_floor_other_slip -->
  <N VAR="u" VALUE="0" />
  <N VAR="v" VALUE="0" />
  <D VAR="w" VALUE="0" />
  <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
</REGION>

<REGION REF="11"> <!-- WT_inlet -->
  <D VAR="u" VALUE="1.0" />
  <D VAR="v" VALUE="0.0" />
  <D VAR="w" VALUE="0.0" />
  <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
</REGION>

<REGION REF="12"> <!-- WT_outlet -->
  <N VAR="u" USERDEFINEDTYPE="HOutflow" VALUE="0" />
  <N VAR="v" USERDEFINEDTYPE="HOutflow" VALUE="0" />

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        <N VAR="w" USERDEFINEDTYPE="HOutflow" VALUE="0" />
        <D VAR="p" USERDEFINEDTYPE="HOutflow" VALUE="0" />
    </REGION>

    <REGION REF="13"> <!-- WT_roof -->
        <N VAR="u" VALUE="0" />
        <N VAR="v" VALUE="0" />
        <D VAR="w" VALUE="0" />
        <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
    </REGION>

    <REGION REF="14"> <!-- WT_symmetry -->
        <N VAR="u" VALUE="0" />
        <D VAR="v" VALUE="0" />
        <N VAR="w" VALUE="0" />
        <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
    </REGION>

    <REGION REF="15"> <!-- WT_wall -->
        <N VAR="u" VALUE="0" />
        <D VAR="v" VALUE="0" />
        <N VAR="w" VALUE="0" />
        <N VAR="p" USERDEFINEDTYPE="H" VALUE="0" />
    </REGION>

</BOUNDARYCONDITIONS>
<FUNCTION NAME="InitialConditions">
    <F VAR="u,v,w" FILE="restart.fld"/>
    <E VAR="p" VALUE="0"/>
</FUNCTION>
</CONDITIONS>
<FILTERS>
    <FILTER TYPE="AverageFields"><!-- 3D Average field -->
        <PARAM NAME="OutputFile">rig_meanfields.fld</PARAM>
        <PARAM NAME="OutputFrequency">StepsPerCTU</PARAM>
        <PARAM NAME="SampleFrequency">100</PARAM>
    </FILTER>
    <FILTER TYPE="AeroForces"><!-- forces_FWING_TOTAL -->
        <PARAM NAME="OutputFile">FWING_TOTAL_forces.fce</PARAM>
        <PARAM NAME="OutputFrequency">10</PARAM>
        <PARAM NAME="Boundary">B[0,1,2,3,4]</PARAM>
    </FILTER>
    <FILTER TYPE="AeroForces"><!-- forces_LFW_element_1 -->
        <PARAM NAME="OutputFile">LFW_element_1_forces.fce</PARAM>
        <PARAM NAME="OutputFrequency">10</PARAM>
        <PARAM NAME="Boundary">B[1]</PARAM>
    </FILTER>
    <FILTER TYPE="AeroForces"><!-- forces_LFW_element_2 -->

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    <PARAM NAME="OutputFile">LFW_element_2_forces.fce</PARAM>
    <PARAM NAME="OutputFrequency">10</PARAM>
    <PARAM NAME="Boundary">B[2]</PARAM>
</FILTER>
<FILTER TYPE="AeroForces"><!-- forces_LFW_element_4 -->
    <PARAM NAME="OutputFile">LFW_element_4_forces.fce</PARAM>
    <PARAM NAME="OutputFrequency">10</PARAM>
    <PARAM NAME="Boundary">B[3]</PARAM>
</FILTER>
<FILTER TYPE="AeroForces"><!-- forces_LFW_fia_mp -->
    <PARAM NAME="OutputFile">LFW_fia_mp_forces.fce</PARAM>
    <PARAM NAME="OutputFrequency">10</PARAM>
    <PARAM NAME="Boundary">B[0]</PARAM>
</FILTER>
<FILTER TYPE="AeroForces"><!-- forces_WF_TOTAL -->
    <PARAM NAME="OutputFile">WF_TOTAL_forces.fce</PARAM>
    <PARAM NAME="OutputFrequency">10</PARAM>
    <PARAM NAME="Boundary">B[0,1,2,3,4,5,6,7,8]</PARAM>
</FILTER>

<FILTER TYPE="ModalEnergy"><!-- model_energy -->
    <PARAM NAME="OutputFile">EnergyFile</PARAM>
    <PARAM NAME="OutputFrequency">100</PARAM>
</FILTER>
<FILTER TYPE="HistoryPoints"><!-- IFW_probes at points -->
    <PARAM NAME="OutputFile">Vortices</PARAM>
    <PARAM NAME="OutputFrequency">10</PARAM>
    <PARAM NAME="Points">
        -0.294 -0.55555 0.11211
        -0.294 -0.68059 0.16604
    </PARAM>
</FILTER>
<FILTER TYPE="HistoryPoints"><!-- IFW_probes on a Plane -->
    <PARAM NAME="OutputFile">PIV_Plane_1</PARAM>
    <PARAM NAME="OutputFrequency">1000</PARAM>
    <PARAM NAME="plane">259,257,-0.294,-0.9,-0.025,-0.294,-0.2,-0.025,-0.294,-
0.2,0.70,-0.294,-0.9,0.70
    </PARAM>
</FILTER>
<FILTER TYPE="FieldConvert"><!--isocontour of vorticity-->
    <PARAM NAME="OutputFile">iso_Vorticity.vtu</PARAM>
    <PARAM NAME="OutputFrequency">1000</PARAM>
    <PARAM NAME="Modules">vorticity isocontour:fieldid=0:fieldvalue=0.1
    </PARAM>
</FILTER>
</FILTERS>
</NEKTAR>

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