

#1251: Radioss – Rigid Walls

Product: Radioss

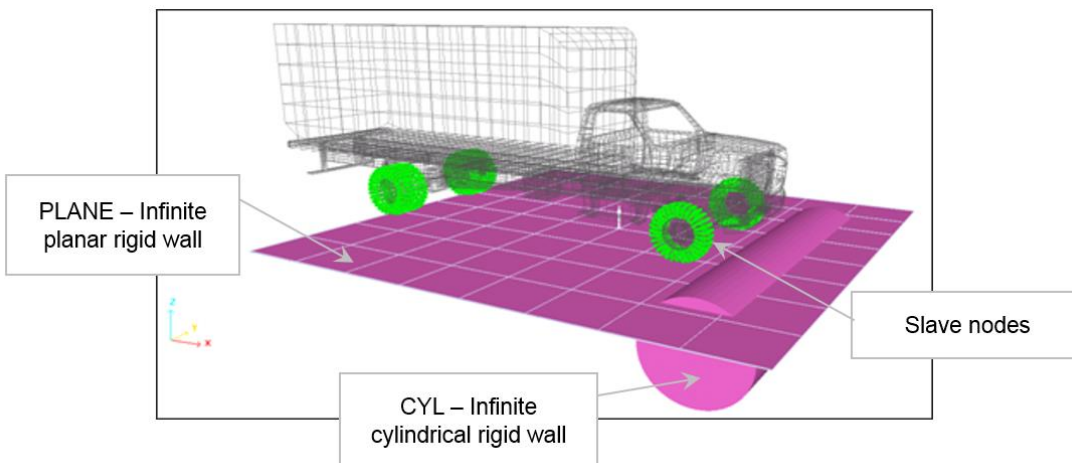
Product Version: HyperMesh 12.0 and above

Topic Objective

Rigid Walls in Radioss

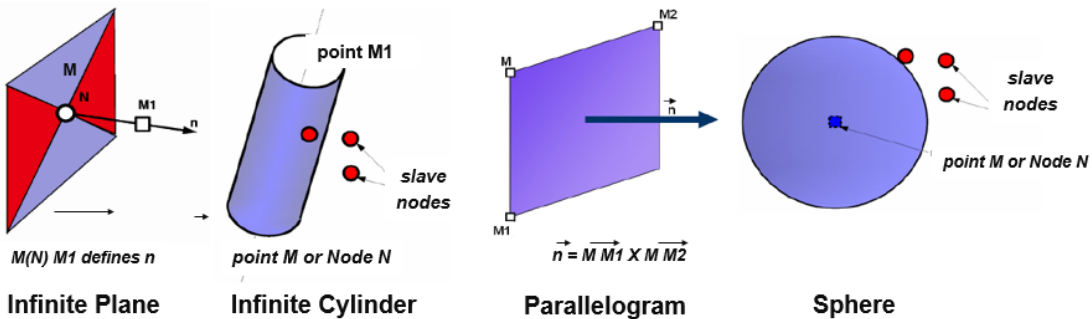
Topic Details

Rigid Walls allow for an easy way to define an interface between a rigid surface and nodes of a deformable body



Rigid Walls /RWALL: Four Types

1. Infinite plane
2. Infinite cylinder of diameter Φ
3. Sphere of diameter Φ
4. Parallelogram



Rigid Walls /RWALL

- A Rigid Wall is defined by a Surface Type and a group of Slave Nodes

- The slave nodes to a rigid wall can be defined as a group of nodes and/or as nodes initially at a distance less than the distance (D_{search}) from the rigid wall
- Each wall can be fixed (point M) or moving (node N)
- A Rigid Wall is a Kinematic Condition
 - If a slave node penetrates the rigid wall surface a new velocity is computed
 - From this velocity, the impulse and rigid wall force are determined

Example of fixed infinite planar rigid wall:

```

/RWALL/PLANE)3
Floor
#      N      SLIDE  gr_nod1  gr_nod2
#      0      0      633      0
#      Distance  Friction  Diameter  Ffac  Ifq
#      0      0      0      0      0
#      Xm      Ym      Zm
#      -1500   0      0
#      Xm1     Ym1     Zm1
#      -1500   0      1
    
```

Example of spherical rigid wall with mass and initial velocity:

```

/RWALL/SPHER)1
PUNCH
#      N      SLIDE  gr_nod1  gr_nod2
#      4067   0      5      8
#      Distance  Friction  Diameter  Ffac  Ifq
#      0      0      12.7  0      0
#      Mass      Vx_0     Vy_0     Vz_0
#      5.0      0      0      -678.2
    
```

Rigid Walls /RWALL: Limitations & Solution

Some limitations with Rigid Walls

- Can only be fixed or have initial velocity – may want to move rigid object with an imposed displacement function
- Can result in Incompatible Kinematic Condition – a result of nodes belonging to another kinematic condition and the rigid wall

Solution

Best practice is to use rigid body connected to a simple mesh representing the rigid object

- Easy to define more arbitrary shapes
- Can impose displacements, velocities according to function
- Removes issue with Incompatible Kinematic Conditions

