EXTERNAL INCOMPRESSIBLE FLOW OVER HULL OF SHIP

2d_hull_with_mod

1. copy the files in the folder 0.org to 0 or rename the folder 0.org to 0
2. fluentMeshToFoam Mesh_File.msh - conversion of .msh mesh file to foam format
3. Open the p and U file in 0 folder change the following boundary name

wall_surface_body to wall-surface_body

4. changeDictionary
5. simpleFoam
6. save a .foam file for post processing in paraview

2d_hull_without_mod

1. copy the files in the folder 0.org to 0 or rename the folder 0.org to 0
2. fluentMeshToFoam Mesh_File.msh - conversion of .msh mesh file to foam format
3. changeDictionary
4. change the forces function in controlDict file to forces coefficient type as follows

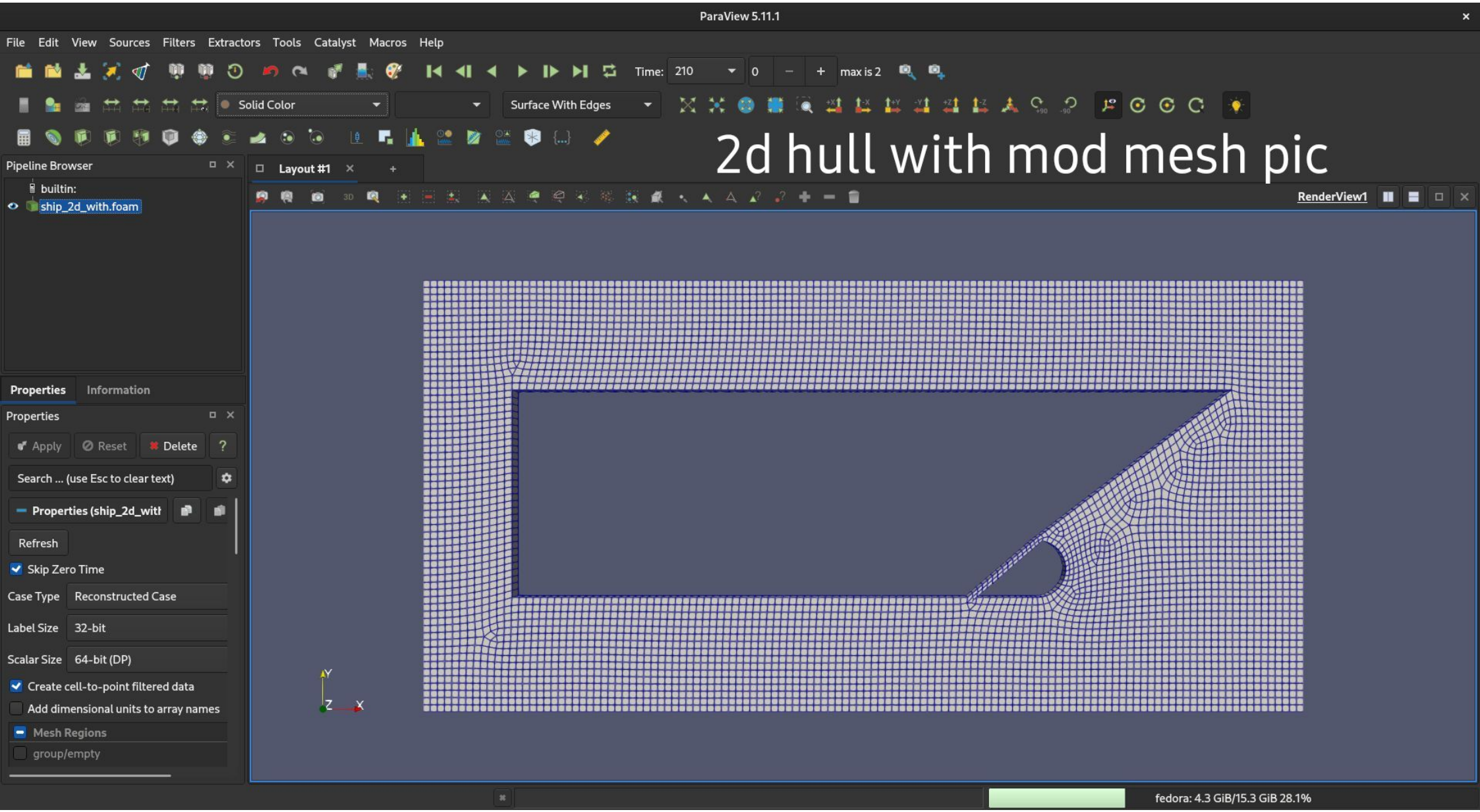
```
libs    ( "libturbulenceModels.dll" "libfvOptions.dll" "libturbulenceModelSchemes.dll" );
functions
{

forceCoeffs1
{
   // Mandatory entries
   type          forceCoeffs;
   libs          ("libforces.so");
   patches       (wall_surface_body);


   // Optional entries

   // Field names
   p             p;
   U             U;
   rho           rhoInf;

   rhoInf        1.0;
   log           true;

   // Reference pressure [Pa]
   pRef          0;

   // Include porosity effects?
   porosity      no;

   // Store and write volume field representations of forces and moments
   writeFields   yes;
```

```
    // Centre of rotation for moment calculations
    CofR            (0 0 0);

    // Lift direction
    liftDir         (0 0 1);

    // Drag direction
    dragDir         (1 0 0);

    // Pitch axis
    pitchAxis       (0 1 0);

    // Freestream velocity magnitude [m/s]
    magUInf         1.0;

    // Reference length [m]
    lRef            1;

    // Reference area [m2]
    Aref            1.0;

    // Spatial data binning
    // - extents given by the bounds of the input geometry
    binData
    {
        nBin        20;
        direction   (1 0 0);
        cumulative  yes;
    }
}
```

5. run simpleFoam
6. save the results as .foam file for post processsing

3d_hull_analysis

1. copy the files in the folder 0.org to 0 or rename the folder 0.org to 0
2. blockMesh
3. snappyHexMesh -overwrite
4. createPatch -overwrite
5. changeDictionary
6. simpleFoam
7. save the results as .foam file for post processsing


ParaView 5.11.1
File Edit View Sources Filters Extractors Tools Catalyst Macros Help
Time: 210 0 max is 2
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2d hull with mod mesh pic
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ship_2d_with.foam
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Case Type Reconstructed Case
Label Size 32-bit
Scalar Size 64-bit (DP)
Create cell-to-point filtered data
Add dimensional units to array names
Mesh Regions
group/empty
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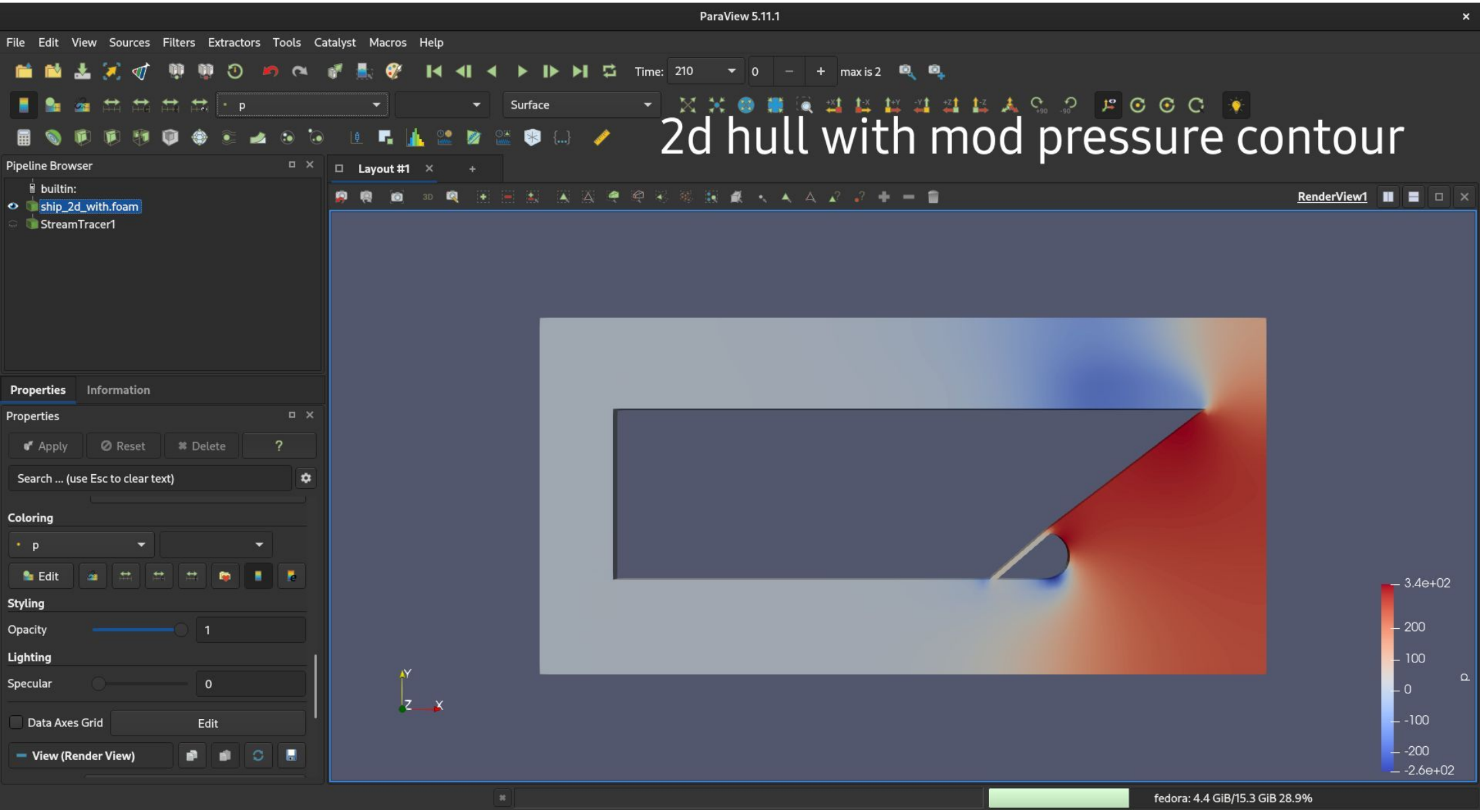
fedora: 4.3 GiB/15.3 GiB 28.1%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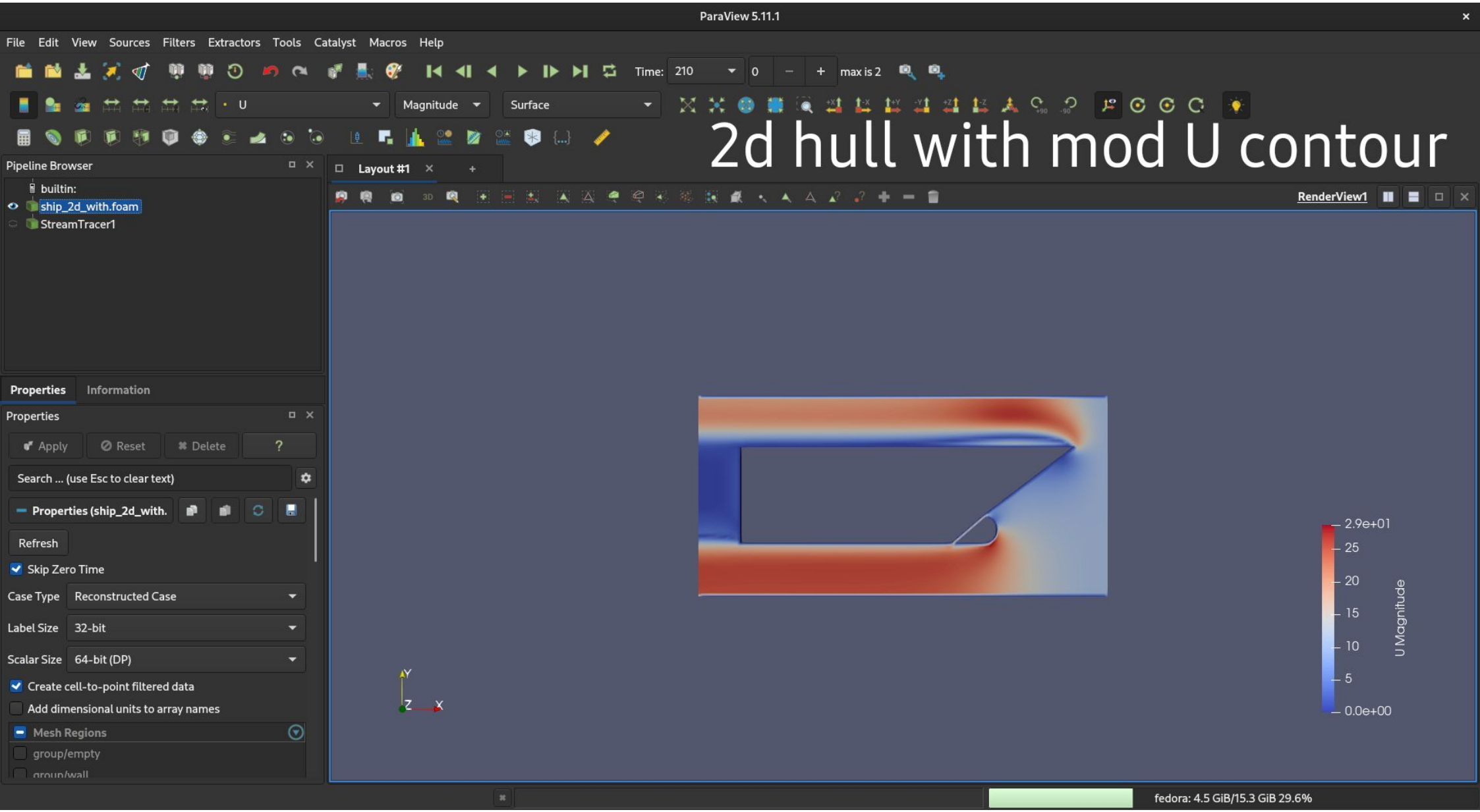
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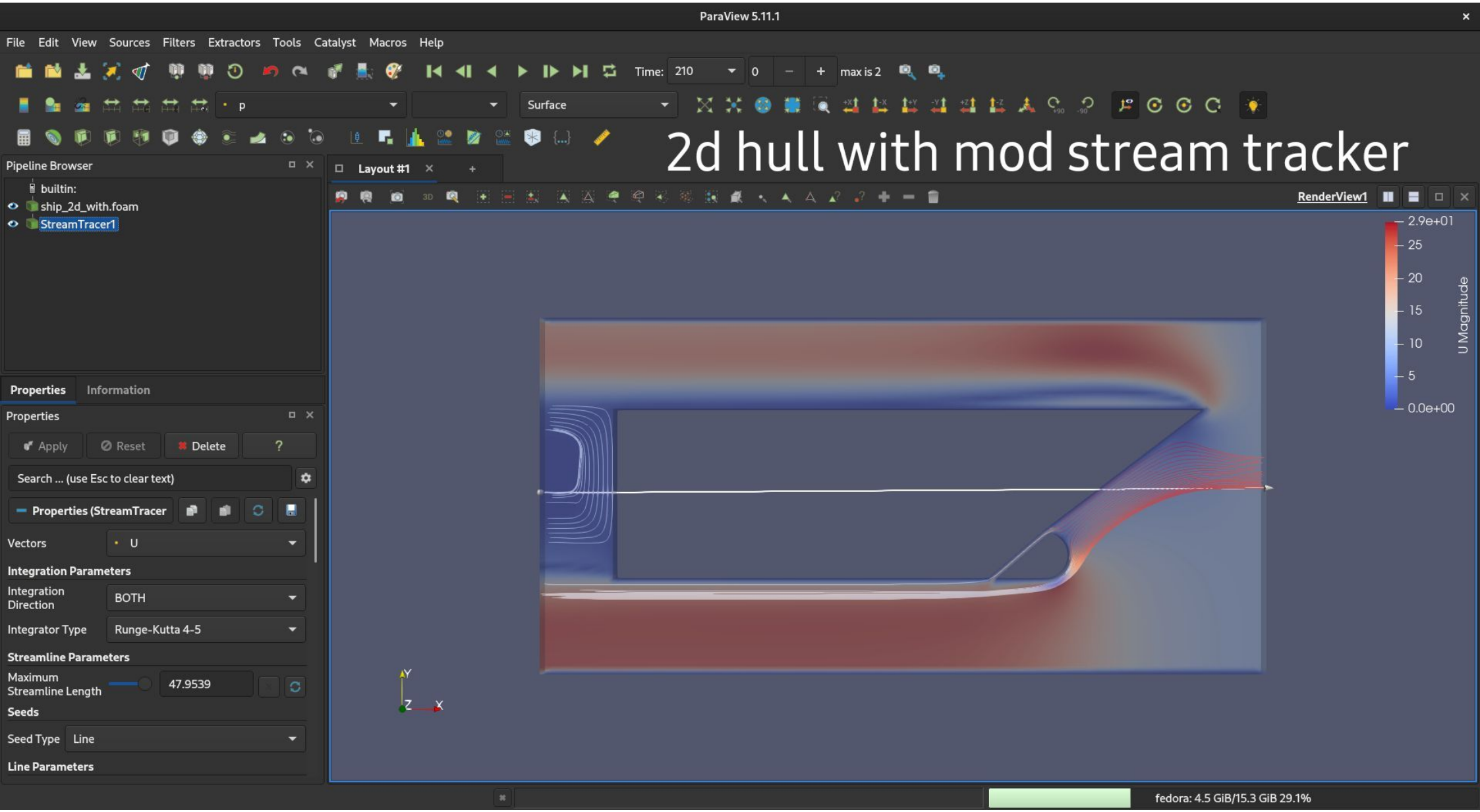
ParaView 5.11.1
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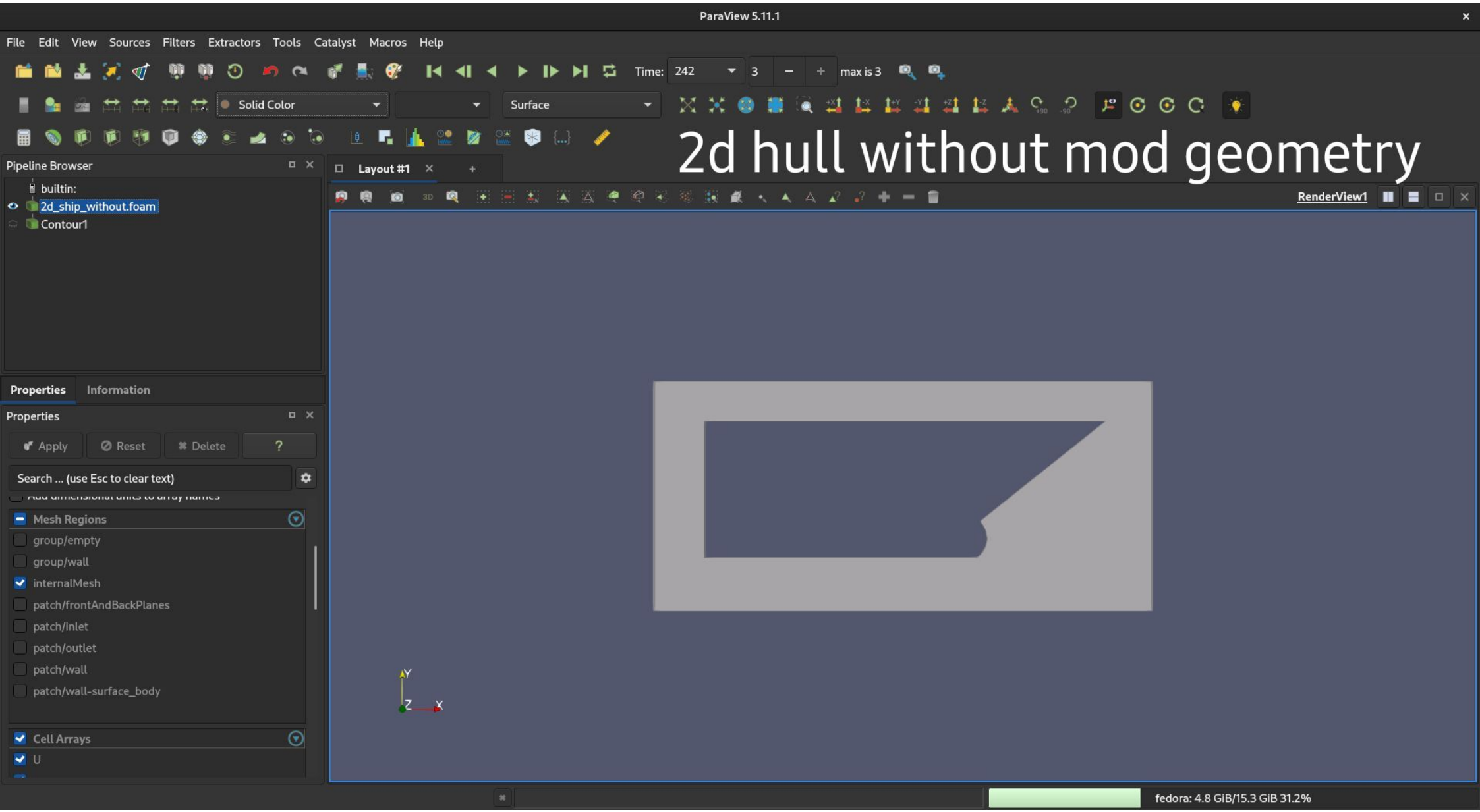
ParaView 5.11.1
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patch/outlet
patch/wall
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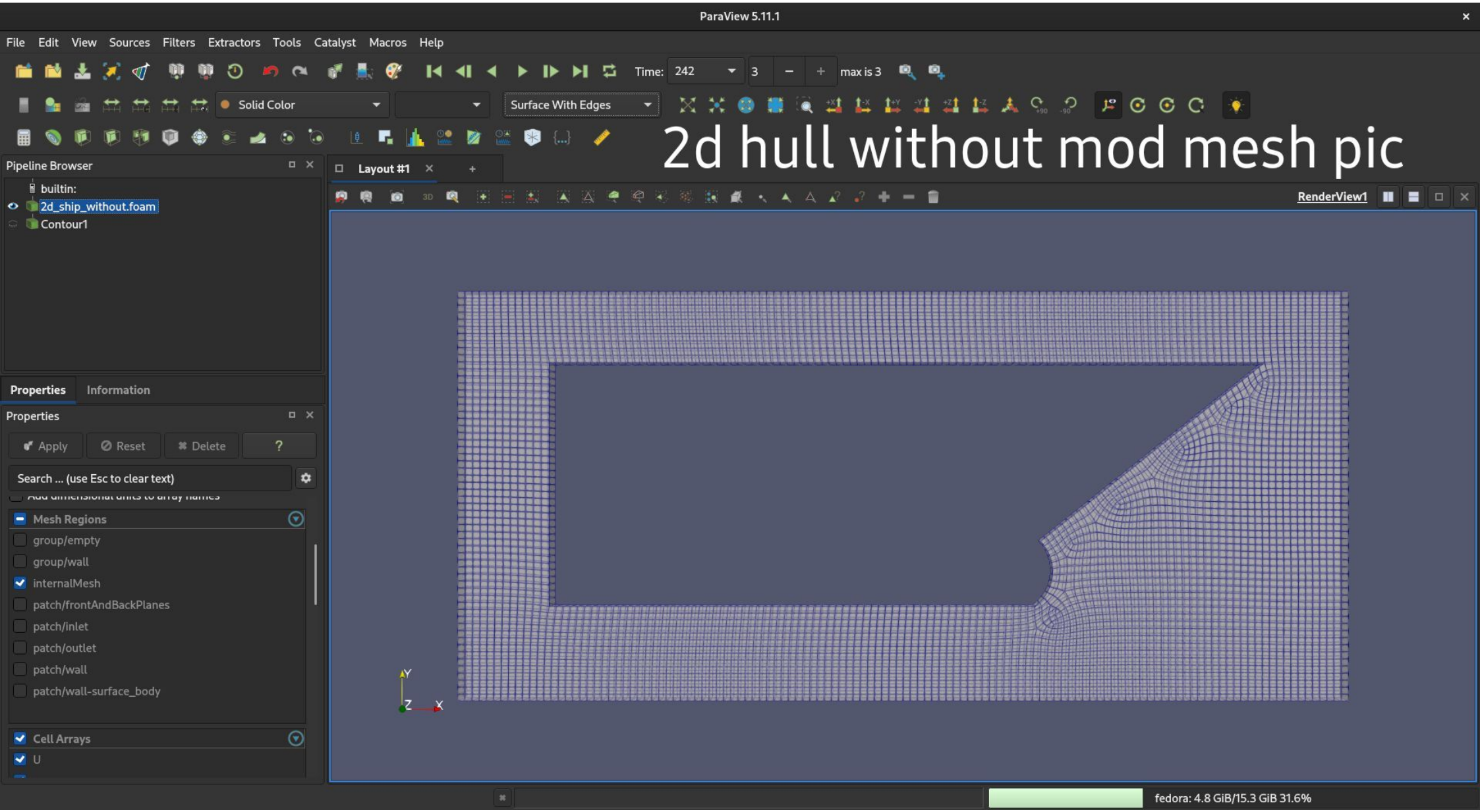
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group/wall
internalMesh
patch/frontAndBackPlanes
patch/inlet
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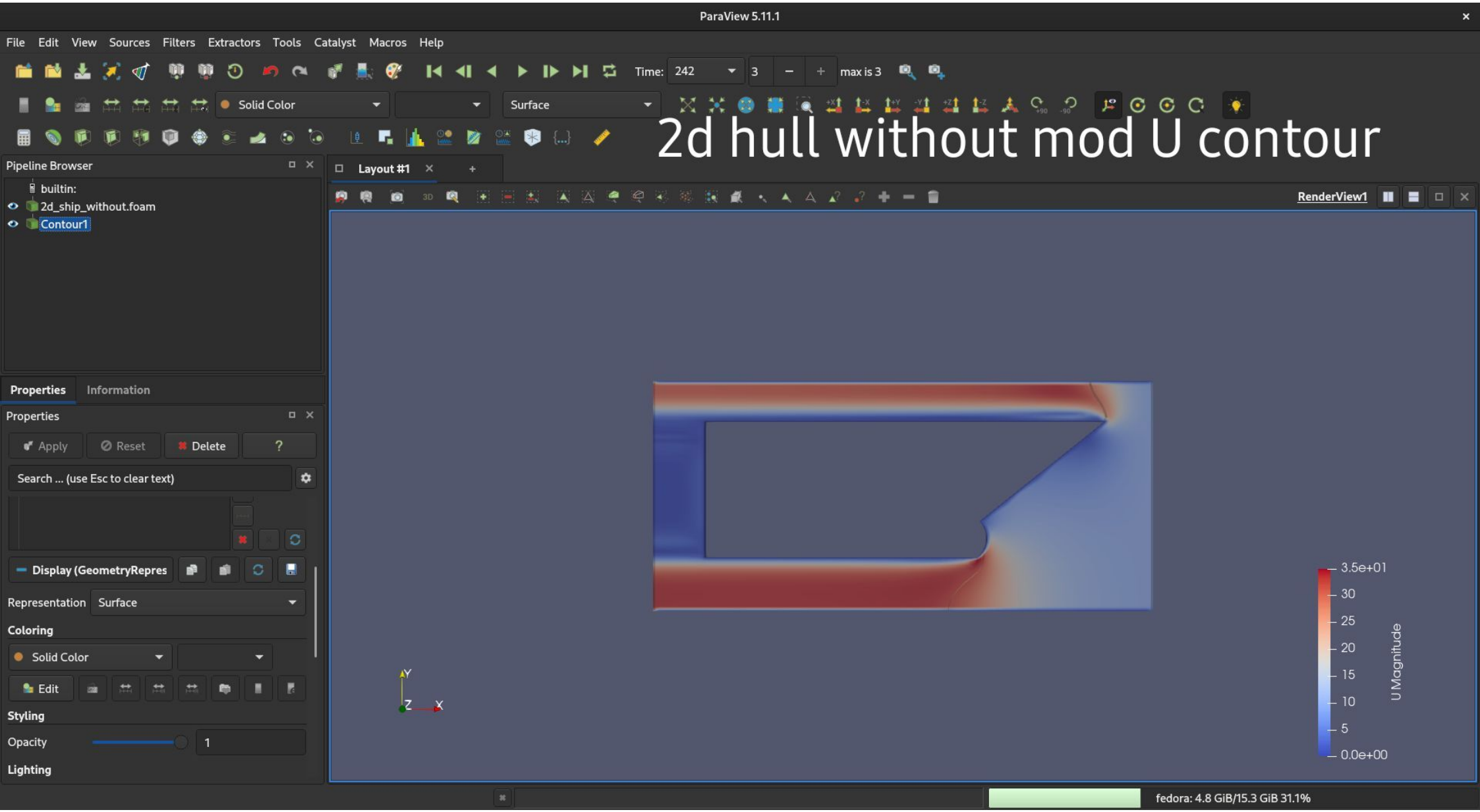
ParaView 5.11.1
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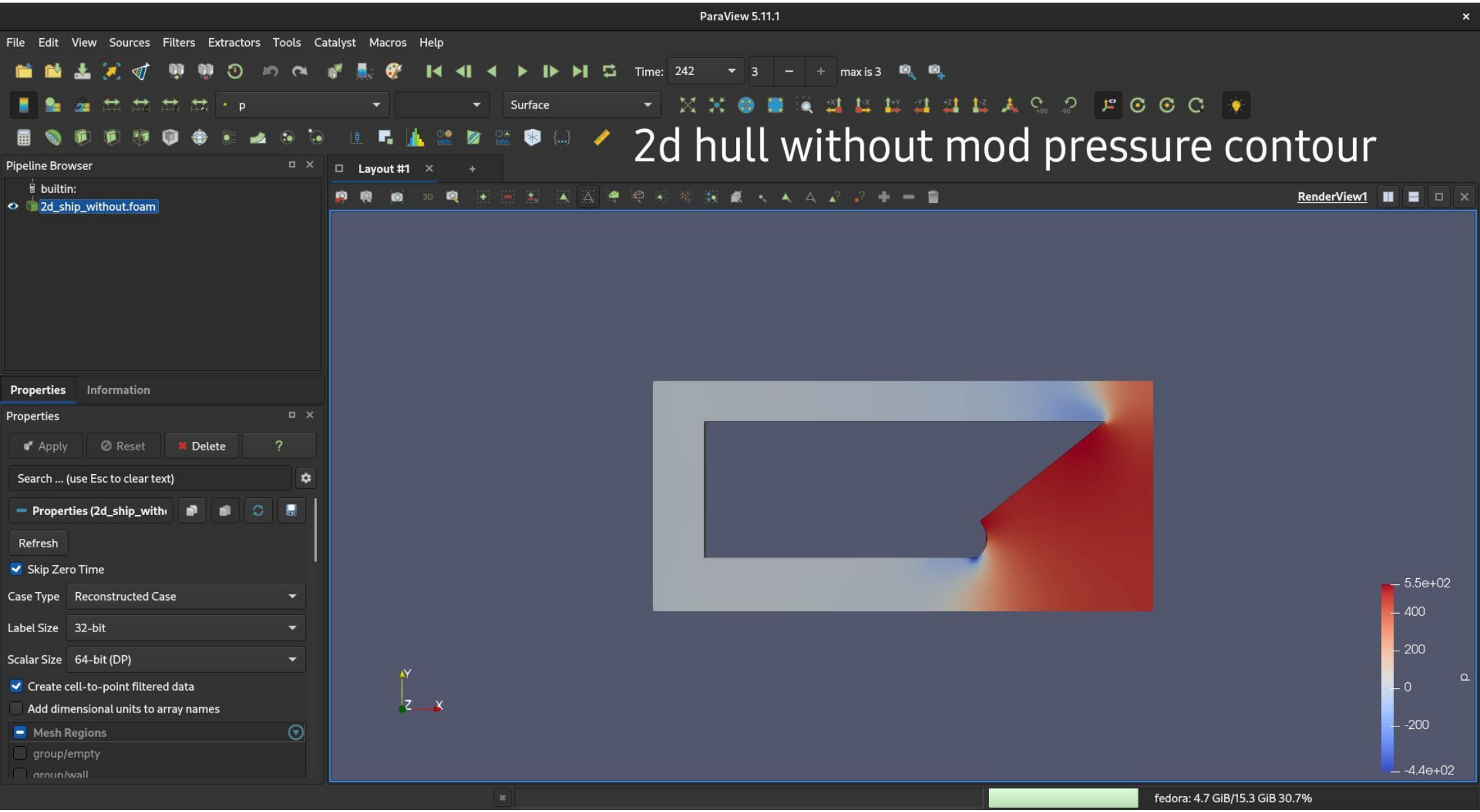
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Add dimensional units to array names
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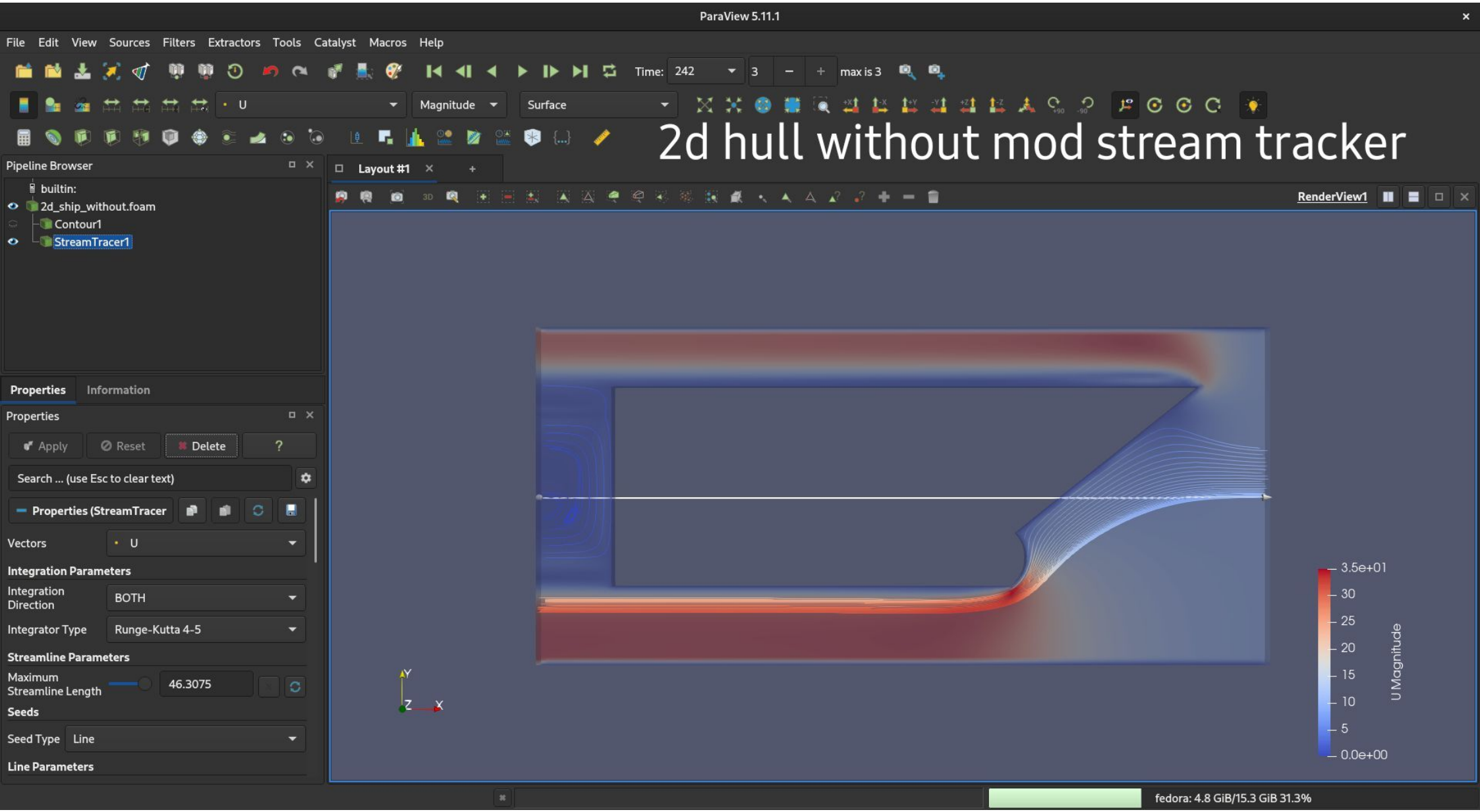
ParaView 5.11.1
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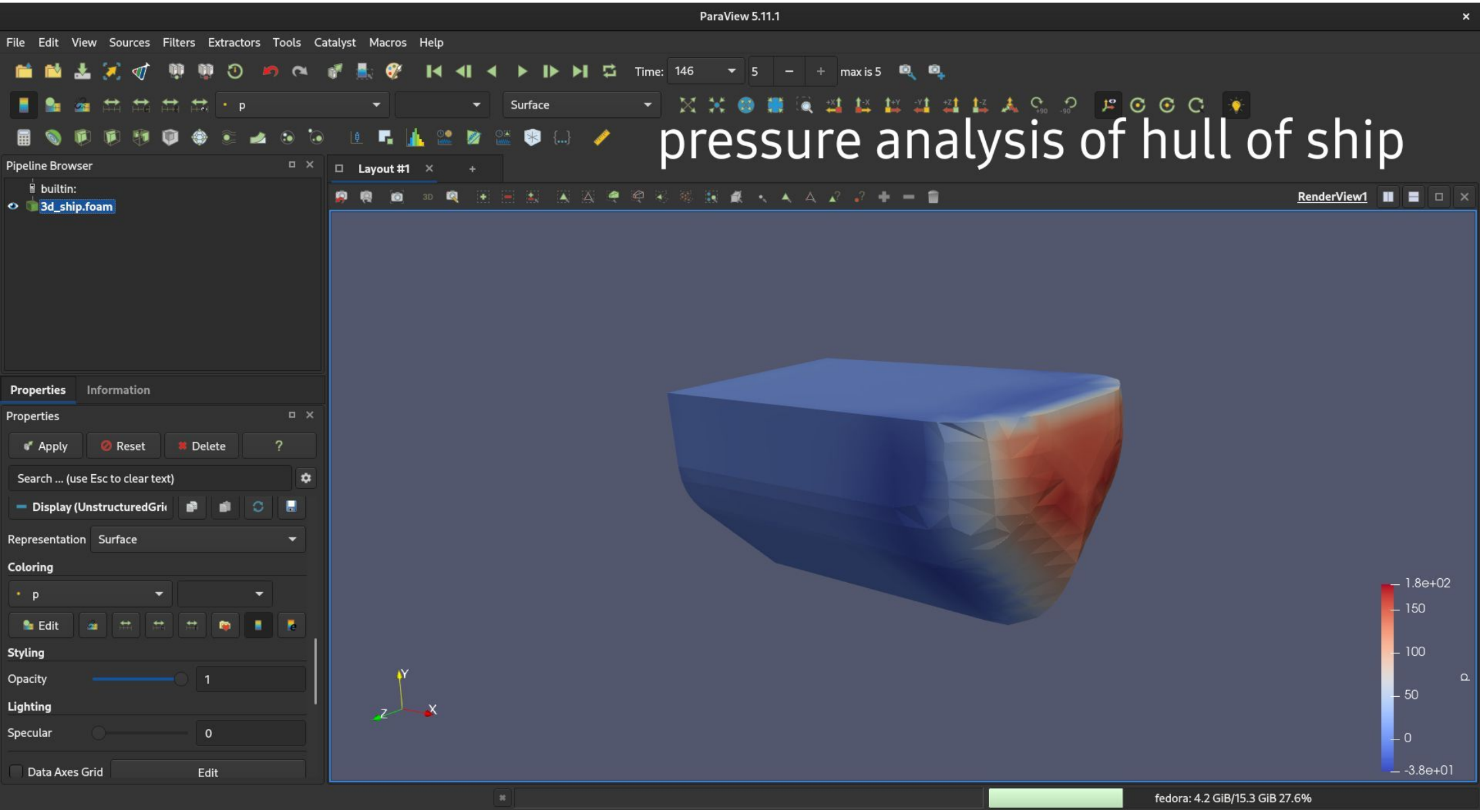
ParaView 5.11.1
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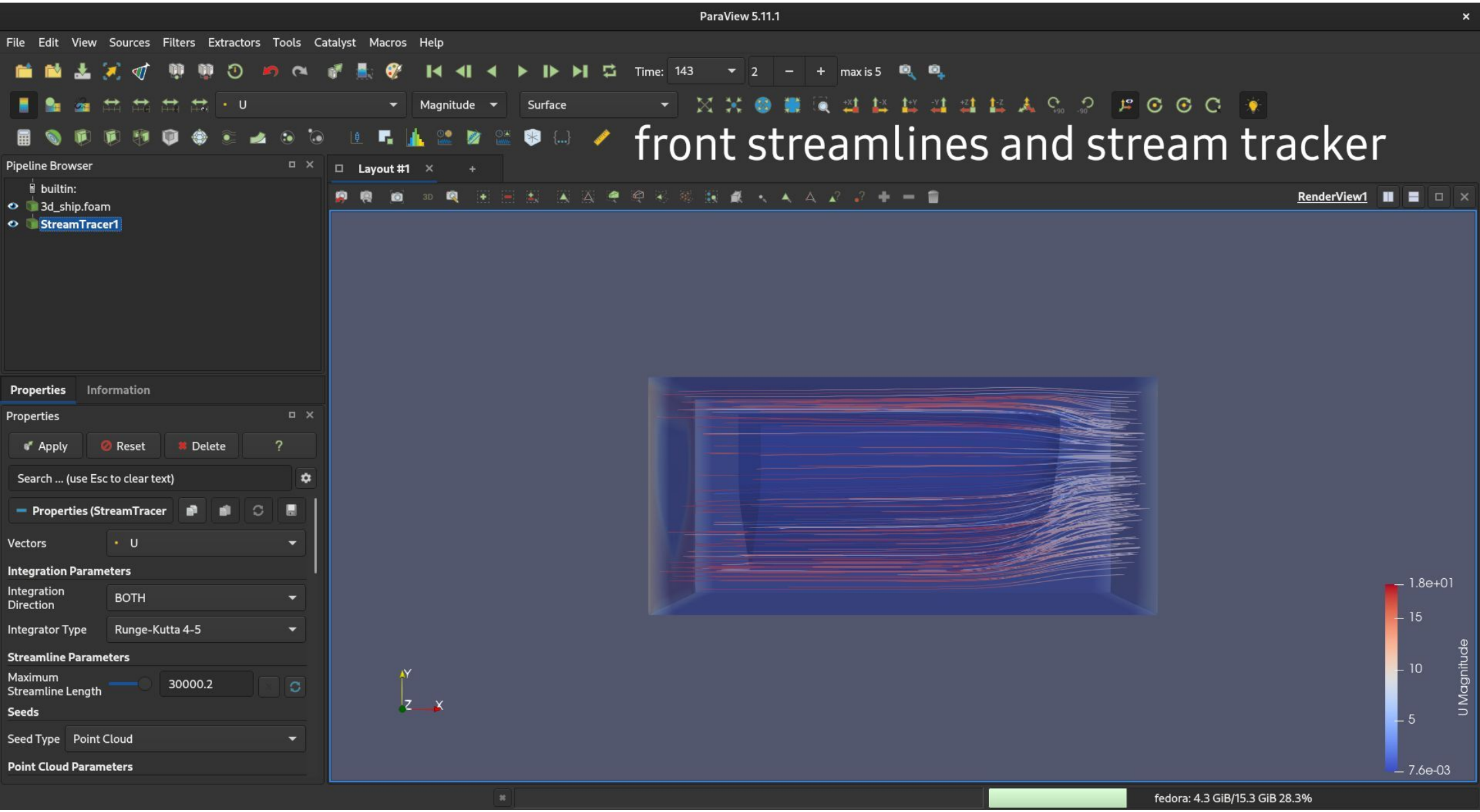
ParaView 5.11.1
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