Tuesday, 8 April 2025

ASSIGNMENT-5 : ADDITION OF NEW VOLUME OUTPUT

This assignment focuses on extending the second assignment's test case by incorporating a new volume output variable. Utilizing the existing mesh and configuration file, targeted modifications were made to SU2's output settings to enable the computation and visualization of the additional field within the simulation results.

IMPLEMENTATION OVERVIEW:

1. Configuration File Modifications:

VOLUME_OUTPUT = (PRIMITIVE, SPEEDSOUND)
HISTORY_OUTPUT = (RMS_RES, AVG_SOUNDSPEED)
SCREEN_OUTPUT = (INNER_ITER, RMS_DENSITY, AVG_SOUNDSPEED)

2. Code Implementation in CFlowOutput.cpp:

```
void CFlowOutput::LoadVolumeDataScalar(...)
{
        // ... existing variable loading ...

        if (volumeOutput_Map.find("SPEEDSOUND") != volumeOutput_Map.end())
        {
                SetVolumeOutputValue("SPEEDSOUND", iPoint,
          solver[FLOW_SOL]->GetNodes()->GetSoundSpeed(iPoint));
      }
}
```

Volume Data Calculation

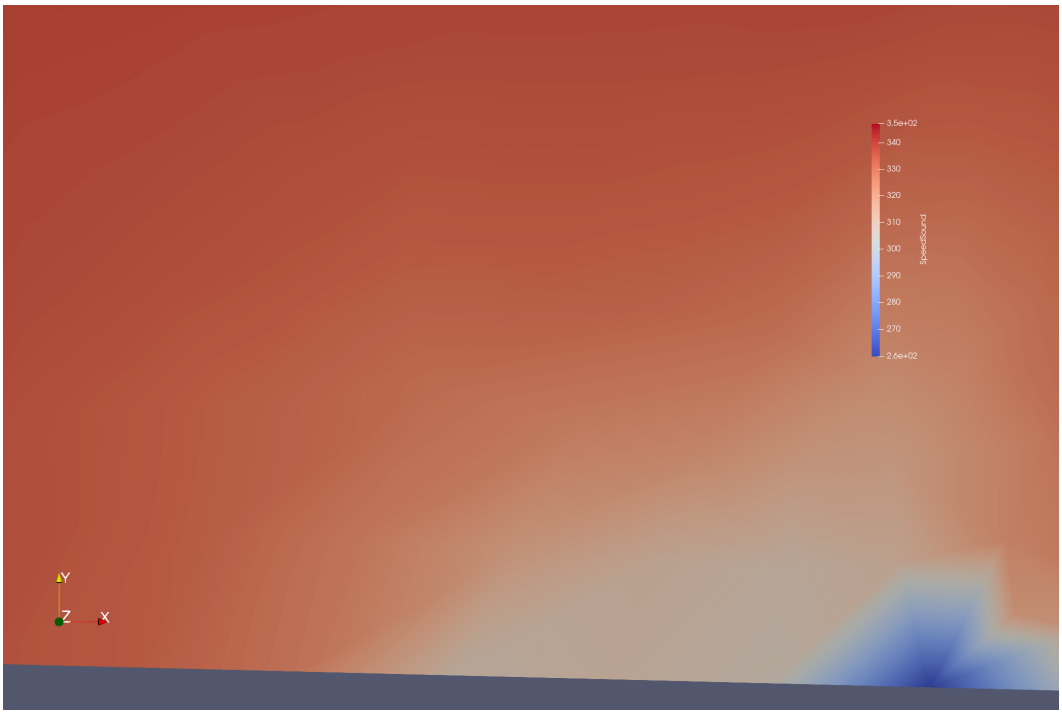
```
void CFlowOutput::LoadHistoryDataScalar(...)
{
        // ... existing outputs ...

        if (historyOutput_Map.find("AVG_SOUNDSPEED") != historyOutput_Map.end())
        {
                SetHistoryOutputValue("AVG_SOUNDSPEED",
          solver[FLOW_SOL]->GetNodes()->GetSoundSpeed(0));
        }
}
```

History/Screen Output

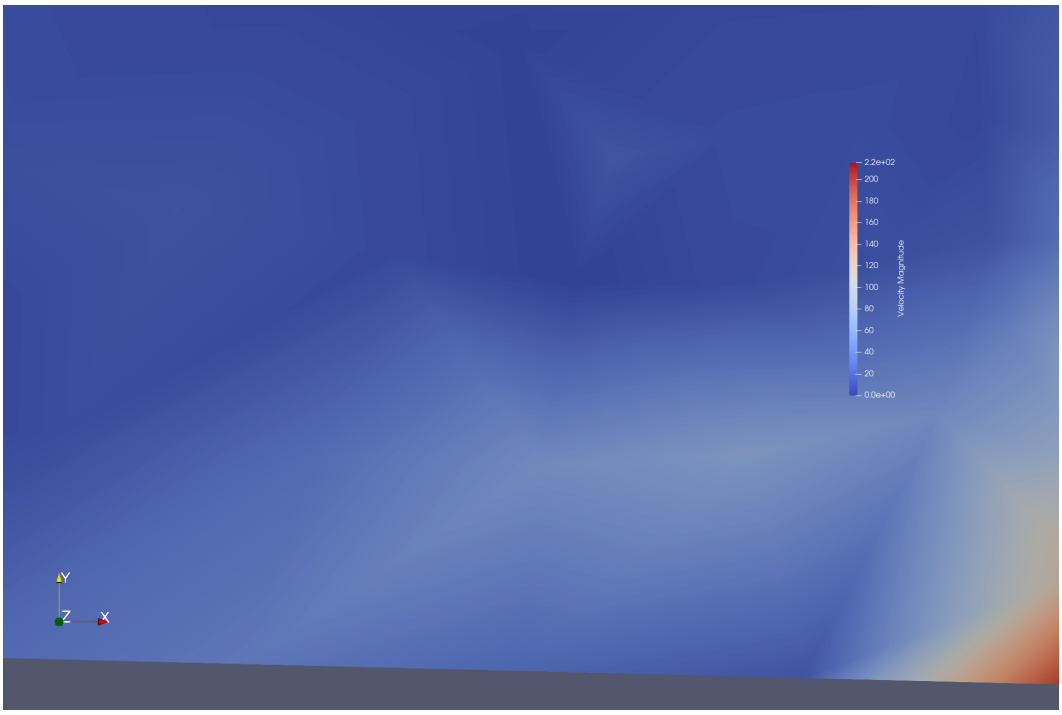
```
void CFlowOutput::SetVolumeOutputFieldsScalarPrimitive(const CConfig* config)
 {
        // ... existing primitive variables ...

        AddVolumeOutput("SPEEDSOUND", "SpeedSound", "SPEEDSOUND", "Speed of
Sound");
 }
```

Volume Output Registration:

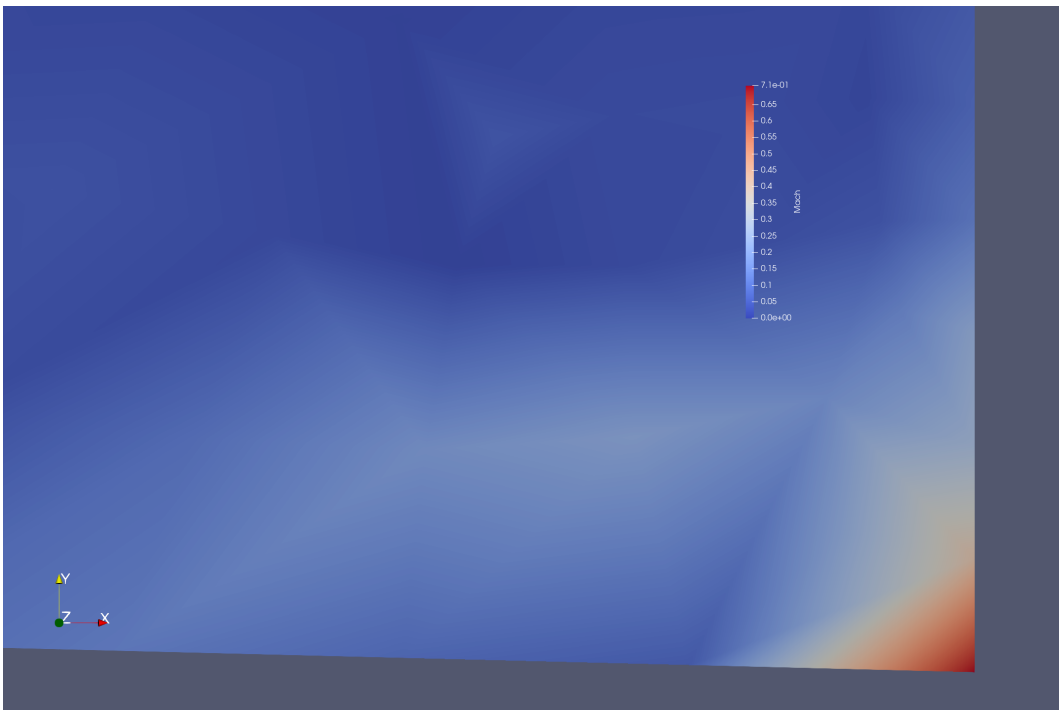
OUTPUTS:



Speed Of Sound Output



Velocity Output



Mach Value Output