

Case1: I use the tutorials-rheoEfoam-ICEO-Nernstplanck to be my basic case, and change the boundary condition of psi. The boundary condition of psi are as follows:

```

elecNorth
{
    type            fixedValue;
    value           uniform 0;
}

elecSouth
{
    type            fixedValue;
    value           uniform 0;
}

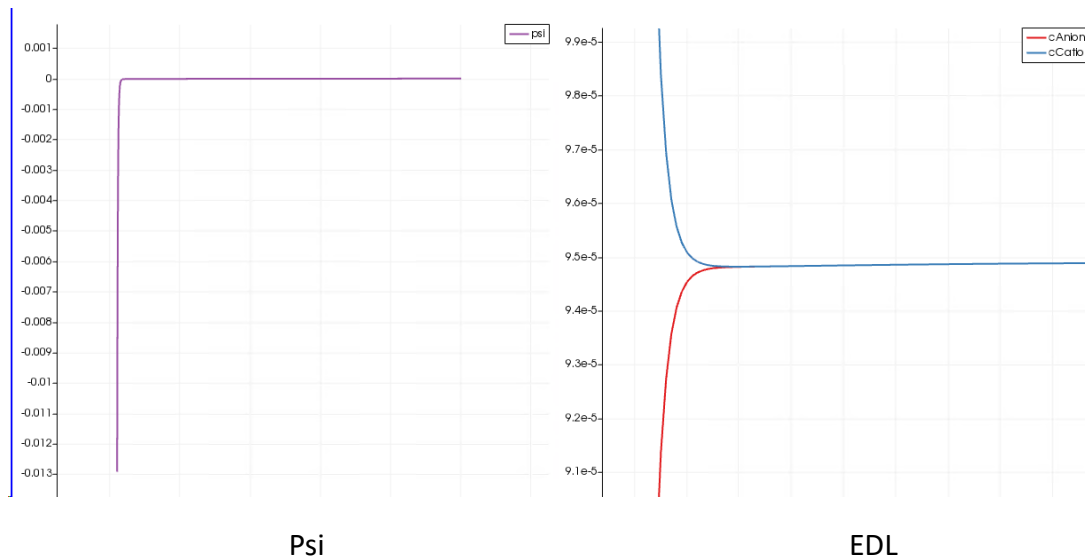
cylinder
{
    type            fixedValue;
    value           uniform -0.012926;
}

"wall.*"
{
    type            zeroGradient;
}

frontAndBack
{
    type            empty;
}

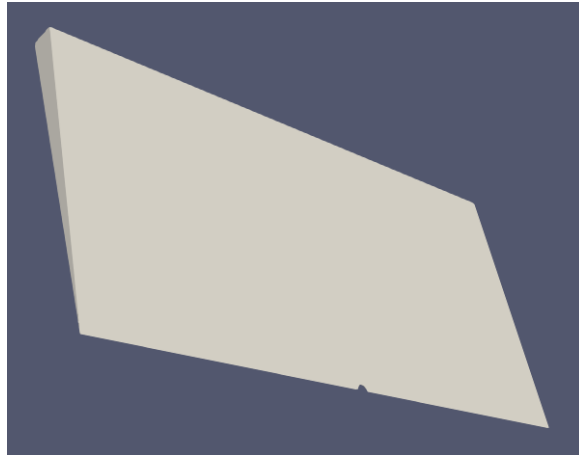
```

Everything else keep the same with the basic case. The correct results are as follows:



Because it's symmetric, so I just show a half of the result. But when I use my own mesh, that is case2;

Case2: Use case1 to be my basic case, I create mesh with my own blockMeshDict. The geometry are as follows:



Because I want to describe a sphere in the middle of a cube with 2D mesh, so I use wedge type. Cell size and resolution and simpleGrading keep same with the basic case1. Everything else also keep the same with the case1 such as boundary condition psi:

```

elecNorth
{
    type          fixedValue;
    value         uniform 0;
}

elecSouth
{
    type          fixedValue;
    value         uniform 0;
}

sphere
{
    type          fixedValue;
    value         uniform -0.012926;
}

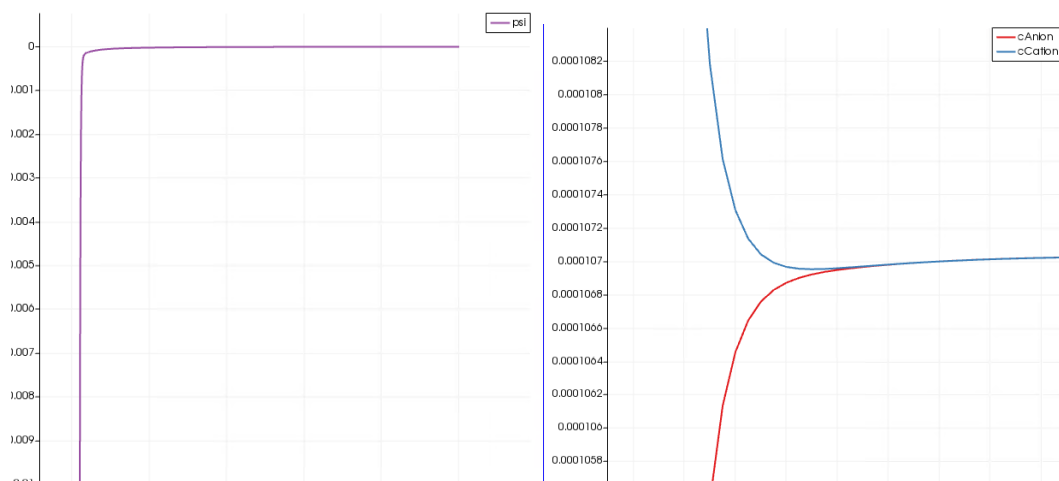
"wall.*"
{
    type          zeroGradient;
}

Back
{
    type          wedge;
}

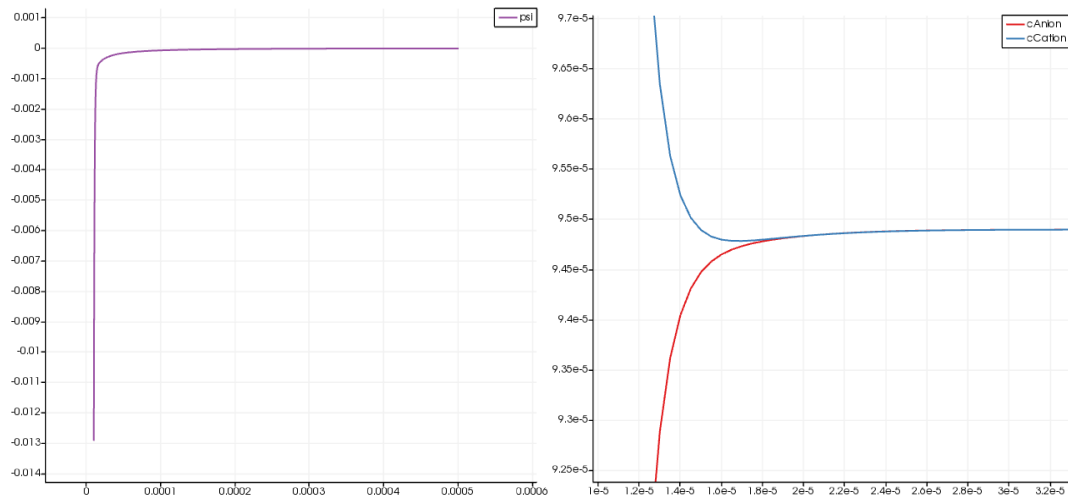
front
{
    type          wedge;
}
}

```

But the result of psi and EDL is not right:



Case3:Using case2 as my basic case,just decrease the deltaT of controlDict from 2e-5 to 1e-5,the result get worse and in a shorter period of time the results get stable:



Case4 : Also using case2 as basic case , I refined the mesh (cell number:50*100+100*100+50*100) and use 2e-6 as my deltaT,The result become really bad and in a very short period of time the results is stable :



I am really confused with the result.In general,the smaller deltaT and higher resolution, the better result,but when I do these job,the result get worse.

How can I get the right result of the EDL($ka=10$) and psi distribution on the surface of a sphere with 2D mesh?Using this method I have successfully calculated the EDL and psi when $ka=0.1$.But when $ka=10$,it does not work.