先从sprayFoam的aachenBomb说起，关于spray的设置的话就是 sprayCloudProperties这个文件

```
solution
{
    //- 是否引入parcel
    active          true;
  //- 是否引入1way 还是2way
    coupled         true;
    //- transient模拟还是steady-state模拟
    transient       yes;

    cellValueSourceCorrection on;
   //- 与流场的Courant number定义相同，涉及到lagrange dt的
    //- 有的时候会遇到在射入parcel的时候如果第一步计算dt太大，可能会出现计算错误
    maxCo           0.3;

    sourceTerms
    {
        schemes
        {
            rho             explicit 1;
            U               explicit 1;
            Yi              explicit 1;
            h               explicit 1;
            radiation       explicit 1;
        }
    }


    //- 在有限体积法中，所有的properties都是储存到cell center中的也就是cell
    //- 所以 cellPoint会interpolate 在当前位置的相关物理量，具体方法需要查，应该是线性的
    interpolationSchemes
    {
        rho             cell;
        U               cellPoint;
        thermo:mu       cell;
        T               cell;
        Cp              cell;
        kappa           cell;
        p               cell;
    }

    integrationSchemes
    {
        U               Euler;
```

```
        T               analytical;
    }
}

//- 这部分是默认的parcel properties，如果涉及到thermo，会根据相关model重新计算，默认的值仅仅是
placeholder
constantProperties
{
    T0              320;

    // place holders for rho0 and Cp0
    // - reset from liquid properties using T0
    rho0            1000;
    Cp0             4187;

    constantVolume  false;
}


subModels
{
    //- parcel受力模型，比如drag, lift, gravity etc...
    particleForces
    {
        sphereDrag;
    }

    injectionModels
    {
        model1
        {
            type            coneInjection;              //- 某些特定的参数不解释了，需要去相
关模型的code查询
            SOI             0;                          //- 喷射开始时间
            massTotal       6.0e-6;                     //- 总喷射质量
            parcelBasisType mass;                       //- 基于什么方法计算 number of
particles in the parcel
            injectionMethod disc;
            flowType        flowRateAndDischarge;
            dInner          0;
            dOuter          1.9e-4;
            duration        1.25e-3;                    //- 总喷射时间
            position        (0 0.0995 0);               //- 喷口位置
            direction       (0 -1 0);                   //- 方向
            parcelsPerSecond 20000000;                  //- 如名字，每秒喷射的parcel数目
            flowRateProfile table                       //- 基于TimeFunction1计算的
                                                        //- 第一列是时间，
                                                        //-第二列是印象中是质量流量，具体怎
么计算忘记了
```

```
            (
                (0              0.1272)
                (4.16667e-05    6.1634)
                (8.33333e-05    9.4778)
                (0.000125       9.5806)
                (0.000166667    9.4184)
                (0.000208333    9.0926)
                (0.00025        8.7011)
                (0.000291667    8.2239)
                (0.000333333    8.0401)
                (0.000375       8.8450)
                (0.000416667    8.9174)
                (0.000458333    8.8688)
                (0.0005         8.8882)
                (0.000541667    8.6923)
                (0.000583333    8.0014)
                (0.000625       7.2582)
                (0.000666667    7.2757)
                (0.000708333    6.9680)
                (0.00075        6.7608)
                (0.000791667    6.6502)
                (0.000833333    6.7695)
                (0.000875       5.5774)
                (0.000916667    4.8649)
                (0.000958333    5.0805)
                (0.001          4.9547)
                (0.00104167     4.5613)
                (0.00108333     4.4536)
                (0.001125       5.2651)
                (0.00116667     5.2560)
                (0.00120833     5.1737)
                (0.00125        3.9213)
                (0.001251       0.0000)
                (1000           0.0000)
            );

            Cd              constant 0.9;                           //- The discharge
coefficient

            thetaInner      constant 0.0;
            thetaOuter      constant 10.0;

            sizeDistribution                                //- 喷射的parcel的size
distribution
            {
                type        RosinRammler;               //- 默认是rosinRammler分布

                RosinRammlerDistribution
                {
```

```
                    minValue        1e-06;
                    maxValue        0.00015;
                    d               0.00015;
                    n               3;
                }
            }
        }
    }

    dispersionModel none;                               //- 是否使用dispersion model

    patchInteractionModel standardWallInteraction;     //- parcel 遇到patch 怎么处理 stick
rebound or escape

    heatTransferModel RanzMarshall;                     //- 传热模型

    compositionModel singlePhaseMixture;                //- 多组分mix模型

    phaseChangeModel liquidEvaporationBoil;             //- 蒸发模型

    surfaceFilmModel none;                              //- 是否生成surfacefilm

    atomizationModel none;                              //- 喷雾atomizationModel，比如bolb
等

    breakupModel    ReitzDiwakar; // ReitzKHRT;        //- Primary breakup 模型 TAB KHRT
等

    stochasticCollisionModel none;                      //- 碰撞模型

    radiation       off;

    standardWallInteractionCoeffs
    {
        type            rebound;
    }

    RanzMarshallCoeffs
    {
        BirdCorrection  true;
    }

    singlePhaseMixtureCoeffs
    {
        phases
        (
            liquid
            {
```

```
                C7H16               1;                  //- 设置液滴的组分组成 然后就去
chemkin部分了，但是也有别的替代方法
            }
        );
    }

    liquidEvaporationBoilCoeffs
    {
        enthalpyTransfer enthalpyDifference;

        activeLiquids    ( C7H16 );
    }

    ReitzDiwakarCoeffs
    {
        solveOscillationEq yes;
        Cbag            6;
        Cb              0.785;
        Cstrip          0.5;
        Cs              10;
    }

/*
    ReitzKHRTCoeffs
    {
        solveOscillationEq yes;
        B0              0.61;
        B1              40;
        Ctau            1;
        CRT             0.1;
        msLimit         0.2;
        WeberLimit      6;
    }
*/
    TABCoeffs
    {
        y0              0;
        yDot0           0;
        Cmu             10;
        Comega          8;
        WeCrit          12;
    }
}


cloudFunctions
{}
```

```
/*--------------------------------*- C++ -*----------------------------------*\
  =========                 |
  \\      /  F ield         | OpenFOAM: The Open Source CFD Toolbox
   \\    /   O peration     | Website:  https://openfoam.org
    \\  /    A nd           | Version:  8
     \\/     M anipulation  |
\*---------------------------------------------------------------------------*/
FoamFile
{
    version     2.0;
    format      ascii;
    class       dictionary;
    location    "constant";
    object      thermophysicalProperties;
}
// * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * //

thermoType
{
    type            hePsiThermo;
    mixture         multiComponentMixture;
    transport       sutherland;
    thermo          janaf;
    energy          sensibleEnthalpy;
    equationOfState perfectGas;
    specie          specie;
}

#include "speciesThermo"

// newFormat       yes;
inertSpecie     air;

liquids
{
    H2O;
}

solids
{}


// ************************************************************************* //
```

```
/*--------------------------------*- C++ -*----------------------------------*\
  =========                 |
  \\      /  F ield         | OpenFOAM: The Open Source CFD Toolbox
   \\    /   O peration     | Website:  https://openfoam.org
```

```
    \\  /    A nd           | Version:  8
     \\/     M anipulation  |
\*---------------------------------------------------------------------------*/

species
(
    air
    H2O
);

air
{
    specie
    {
        nMoles          1;
        molWeight       28.9596;
    }
    thermodynamics
    {
        Tlow            200;
        Thigh           3500;
        Tcommon         1000;
        highCpCoeffs    ( 3.57304 -7.24383e-04 1.67022e-06 -1.26501e-10 -4.20580e-13
-1047.41 3.12431 );
        lowCpCoeffs     ( 3.09589 1.22835e-03 -4.14267e-07 6.56910e-11 -3.87021e-15
-983.191 5.34161 );
    }
    transport
    {
        As              1.67212e-06;
        Ts              170.672;
    }
}

H2O
{
    specie
    {
        molWeight       18.0153;
    }
    thermodynamics
    {
        Tlow            200;
        Thigh           5000;
        Tcommon         1000;
        highCpCoeffs    ( 2.67215 0.00305629 -8.73026e-07 1.201e-10 -6.39162e-15
-29899.2 6.86282 );
        lowCpCoeffs     ( 3.38684 0.00347498 -6.3547e-06 6.96858e-09 -2.50659e-12
-30208.1 2.59023 );
```

```
    }
    transport
    {
        As              1.67212e-06;
        Ts              170.672;
    }
}

// ************************************************************************* //
```

如上即为解决方法，不实用chemkin库，使用别的方法计算，具体不记得怎么叫了，多项式？？

具体继续按方法https://doc.cfd.direct/openfoam/user-guide-v9/thermophysical

openFOAM有一些默认的库

OpenFOAM-8/src/thermophysicalModels/thermophysicalProperties/**liquidProperties**/