

Example Problem

BF3D_sprep

This example problem illustrates the steps involved in using **SutraPrep** *Version 3D.1* to generate input files for a **SUTRA** run. It recreates the **BF** example problem provided in the **SUTRA** *Version 2D3D.1* release package. Step-by-step instructions are given below, followed by a diagram that summarizes the procedure. All files mentioned below are provided in the directory `c:\SutraSuite\SUTRA_2D3D_1\examples\3d\BF3D\BF3D_sprep`. Working through this example will cause all of the files except *BF3D_sprep.prp*, *BF3D.inp*, *SUTRA.FIL*, and *BF3D_sprep.mv* to be generated anew. It is recommended that test runs be performed in a separate working directory to avoid overwriting the original files.

Step 1. Run SutraPrep

The file *BF3D_sprep.prp* is the main input file for **SutraPrep**. In this example, **SutraPrep** will import certain information (the information it does not compute) from datasets 1 – 13 of an existing **SUTRA** main input file, *BF3D.inp*.

To run **SutraPrep** from Windows Explorer, double-click on the file *Shortcut to sutraprep_3D_1.exe* in the directory that contains the **BF3D_sprep** example problem (the `\BF3D_sprep` subdirectory). At the prompt, enter the file name *BF3D_sprep.prp*. **SutraPrep** will generate the following output files:

<i>BF3D_sprep.inp</i>	SUTRA main input
<i>BF3D_sprep.ics</i>	SUTRA initial conditions
<i>BF3D_sprep.wrl</i>	VRML plot of the finite-element mesh outline
<i>BF3D_sprep.prl</i>	Log of the SutraPrep run

(The plot of the mesh outline can be viewed using any software that is compatible with VRML 2.0. A number of such viewers are available on the Internet, and several can be obtained free of charge.)

Step 2. Add solute patch

Because the source of solute covers only part of one face of the six-sided model domain, it cannot be represented using **SutraPrep** and must be entered manually. To enter the solute source, edit dataset 17 (specified-pressure nodes) in the file *BF3D_sprep.inp* so that the concentration associated with the following 24 specified-pressure nodes is changed from 0. to 1.:

3130, 3151, 3172, 3193, 3214, 3235,
3781, 3802, 3823, 3844, 3865, 3886,
4432, 4453, 4474, 4495, 4516, 4537,
5083, 5104, 5125, 5146, 5167, 5188.

For example, the entry for node 3130 in dataset 17 should be changed from

3130 4.7500593746289D-08 0.0000000000000D+00

to

3130 4.7500593746289D-08 1.0000000000000D+00

Note that the 24 lines to be edited do not all appear consecutively in the dataset; they appear in four groups of six lines. Save the edited file as *BF3D_sprep with solute.inp*.

Step 3. Run SUTRA

Create a shortcut to the **SUTRA** executable file, *sutra_2D3D_1.exe*, in the `\BF3D_sprep` subdirectory. Right-click on the shortcut, select "Properties", delete the contents of the "Start in:" box, and click "OK". To run **SUTRA**, double-click on the newly created shortcut.

SUTRA will take the following files as input:

<i>BF3D_sprep_with_solute.inp</i>	SUTRA main input (with solute source added)
<i>BF3D_sprep.ics</i>	SUTRA initial conditions
<i>SUTRA.FIL</i>	SUTRA file assignments

and will generate the following output files:

<i>BF3D_sprep.lst</i>	SUTRA main output
<i>BF3D_sprep.rst</i>	SUTRA restart file
<i>BF3D_sprep.nod</i>	SUTRA nodewise output
<i>BF3D_sprep.ele</i>	SUTRA elementwise output
<i>BF3D_sprep.obs</i>	SUTRA observation output
<i>BF3D_sprep.smy</i>	SUTRA simulation summary

Step 4. Run Model Viewer

If **Model Viewer** is installed on your computer, double-clicking on *BF3D_sprep.mv* will produce a plot of the 3D plume of solute. To rotate the image, place the cursor in the window that contains the image, hold down the left mouse button, and move the mouse.

