

BPL_TEST2_Chemostat - demo

```
In [1]: run -i BPL_TEST2_Chemostat_fmpy_explore.py
```

Linux - run FMU pre-compiled OpenModelica

Model for the process has been setup. Key commands:

- par() - change of parameters and initial values
- init() - change initial values only
- simu() - simulate and plot
- newplot() - make a new plot
- show() - show plot from previous simulation
- disp() - display parameters and initial values from the last simulation
- describe() - describe culture, broth, parameters, variables with values/units

Note that both disp() and describe() takes values from the last simulation and the command process_diagram() brings up the main configuration

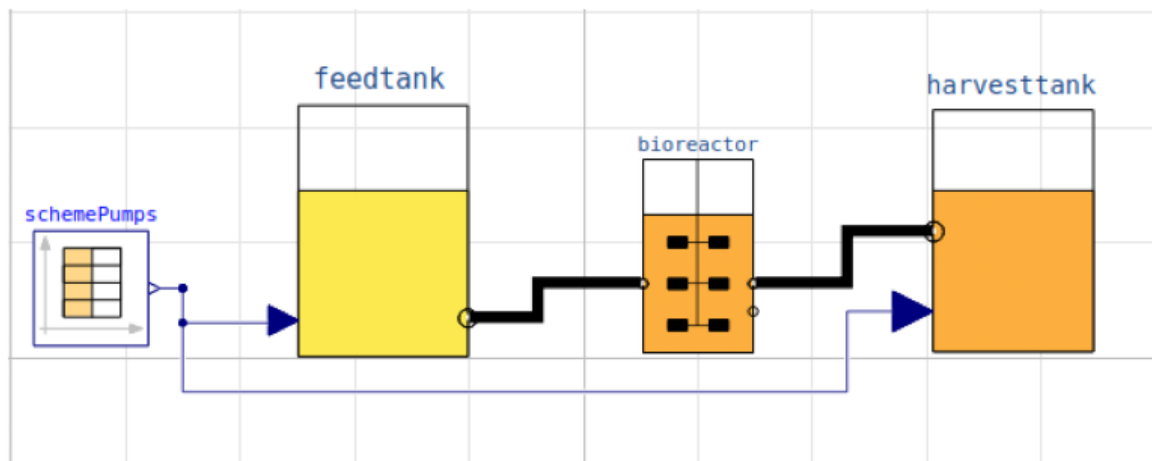
Brief information about a command by help(), eg help(simu)

Key system information is listed with the command system_info()

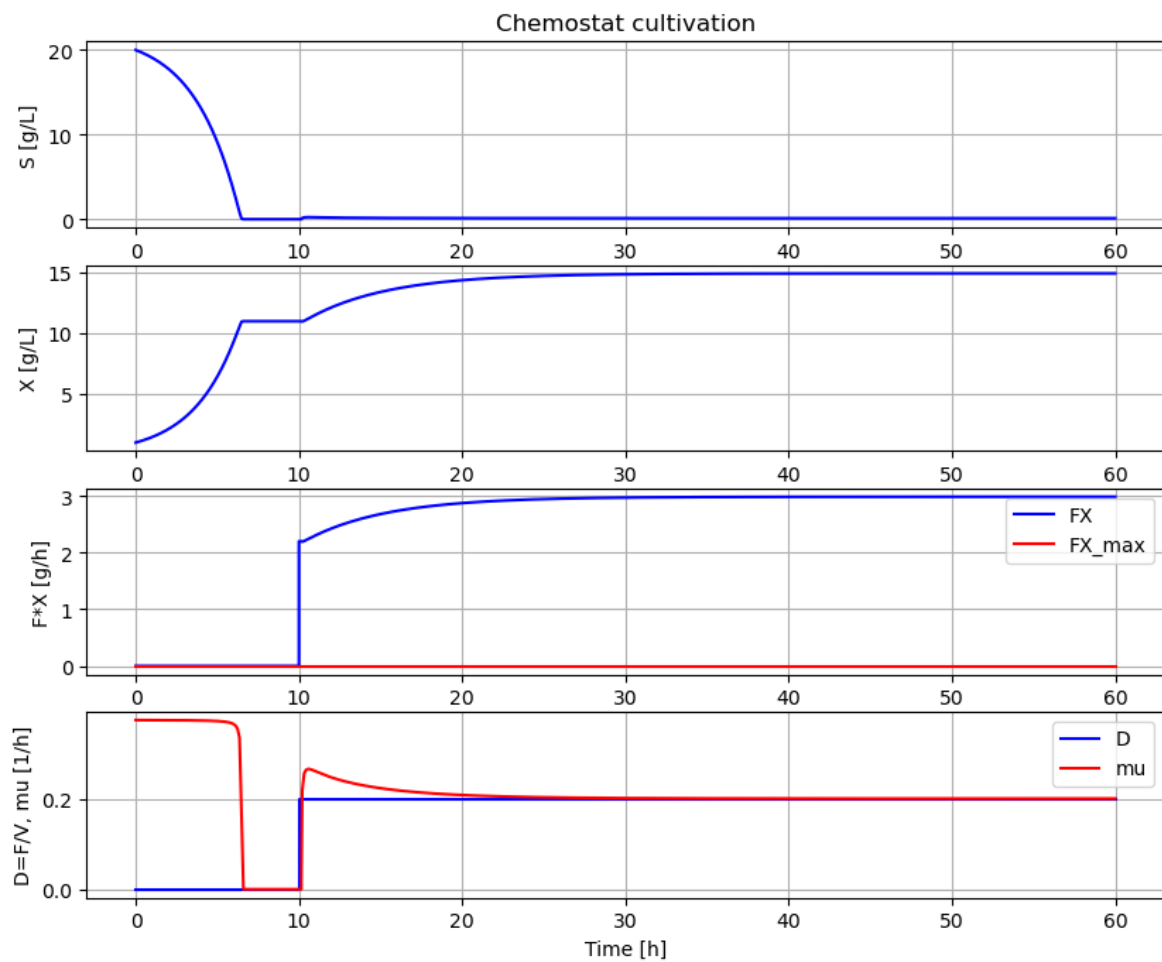
```
In [2]: %matplotlib inline
plt.rcParams['figure.figsize'] = [25/2.54, 20/2.54]
```

```
In [3]: process_diagram()
```

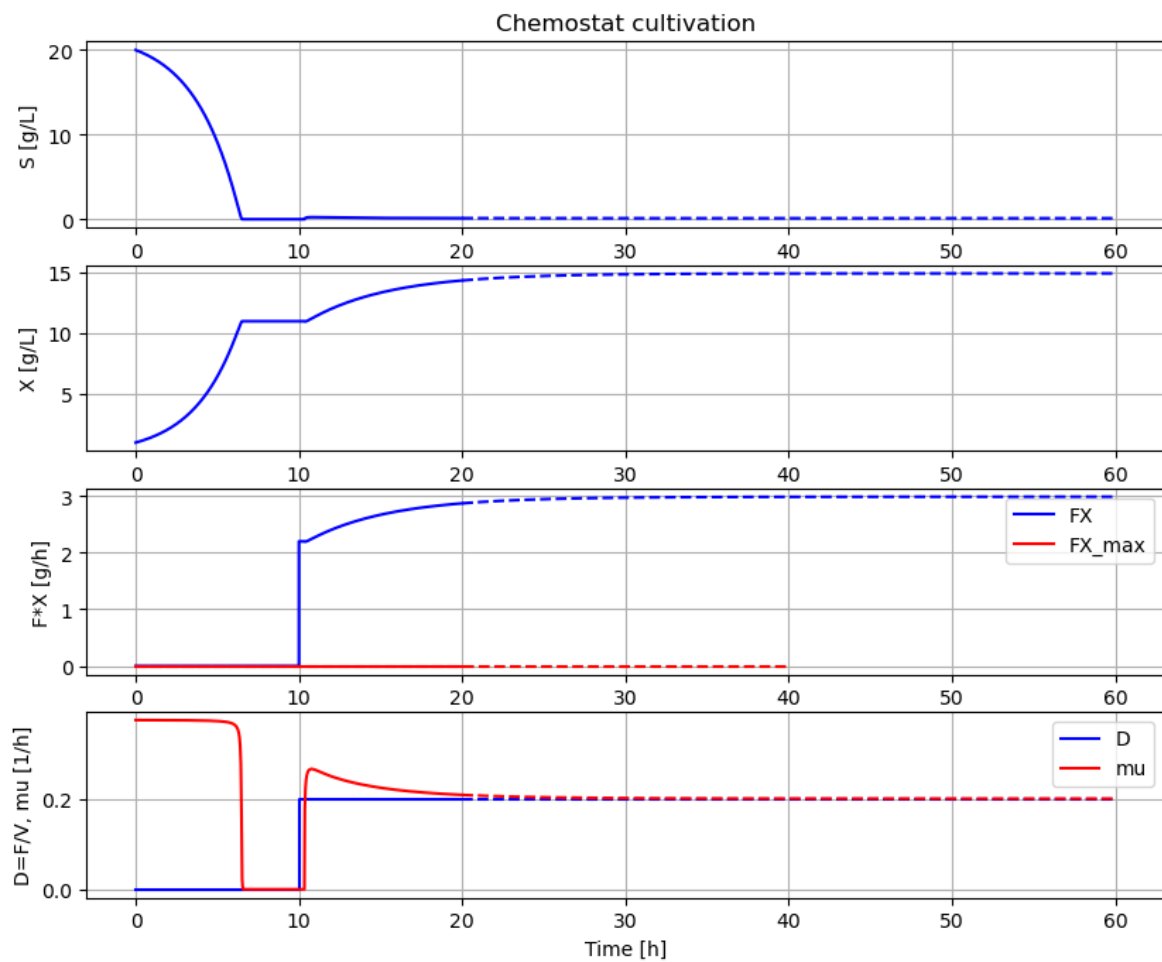
No processDiagram.png file in the FMU, but try the file on disk.



```
In [4]: newplot()
par(Y=0.50, qSmax=0.75, Ks=0.1) # Culture parameters
init(V_start=1.0, VX_start=1.0, VS_start=20) # Bioreactor startup
par(S_in=30, t0=0, F0=0, t1=10, F1=0.2) # Substrate feeding
simu(60)
```



```
In [5]: # Check simu('cont')
newplot()
simu(20)
simu(40,'cont')
```



```
In [6]: disp('culture')
```

```
Y : 0.5
qSmax : 1.0
Ks : 0.1
```

```
In [7]: describe('mu')
```

```
Cell specific growth rate variable : 0.2 [ 1/h ]
```

```
In [8]: describe('parts')
```

```
['bioreactor', 'bioreactor.culture', 'D', 'feedtank', 'harvesttank', 'schemePumps']
```

```
In [9]: describe('MSL')
```

```
MSL: 4.1.0 - used components: RealInput, RealOutput, CombiTimeTable, Types
```

```
In [10]: system_info()
```

System information

- OS: Linux
- Python: 3.12.11
- Scipy: not installed in the notebook
- FMPy: 0.3.26
- FMU by: OpenModelica Compiler OpenModelica 1.26.0~dev-200-gcb3254b
- FMI: 2.0
- Type: ME
- Name: BPL.Examples_TEST2.Chemostat
- Generated: 2025-07-28T07:59:17Z
- MSL: 4.1.0
- Description: Bioprocess Library version 2.3.1
- Interaction: FMU-explore for FMPy version 1.0.1

In [11]: `!lsb_release -a`

```
No LSB modules are available.
Distributor ID: Ubuntu
Description:   Ubuntu 24.04.3 LTS
Release:      24.04
Codename:     noble
```