Dr. Dirk Zimmer

Virtual Physics

15.10.2013

Exercise 1: First Experiments in Dymola

Dymola is Modeling and Simulation Environment building upon the language Modelica. In this exercise, we want to install the software and run our first simulation example.

Task A: Obtain a license and install the software

First, you have to fill out the license agreement. Sign it and hand it to me in the lecture. You can also scan it with your signature on it and send it to me via email. You can obtain a license file, by sending me an email with the heading: "[Dymola License]" containing your full name, student-id number, and department:

dirk.zimmer@dlr.de

You will get the license file attached to my reply. Since I will reply to each mail personally, please be a little patient. You will also receive the username and password that is required for the software download.

Download the Software using the following link:

http://www.dynasim.se/update/

Fill out the form and mention the number of your license file. Follow the instructions of the installer. When you start the software for the first time, it will be in Demo mode and have only very limited capabilities. In order to use the software properly you need to install the license file.

You can the install the license file by selecting "Help->License…" from the program menu and then choosing the tab: "Setup->Local License File…". Here you can select the license file that you have received via email.

Task B: Setup

Click on "Simulation" at the lower right corner of the program window. Then choose "Simulation->Setup…" from the menu. Select the tab "Compiler" and choose one of the available options. If you do not have an appropriate compiler installed, you may install one by downloading the free Visual Studio C++ 2008 Express Edition.

Restart Dymola.

Task C: Run the example

Download the model file: "yeast.mo" from the course web site:

http://www.robotic.de/279

Open the file and look at the model in the built-in text-editor: "Window->View->Modelica Text".

You can simulate the example by switching to the simulation mode. Make sure you simulate for at least 10 seconds (meaning days in our example). Your result should look like this:
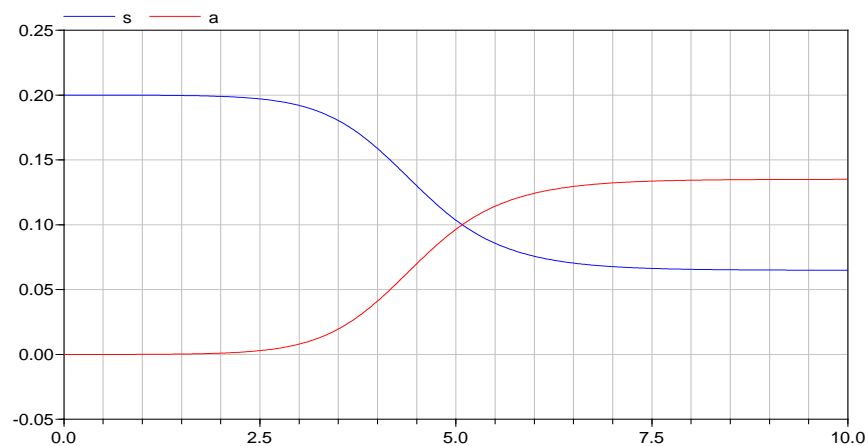
Task D:

Play around with parameters or modify the model equations.

If you modify the feeding coefficient, does it influence the population and does it influence the remaining concentration of sugar and alcohol?

If you increase the concentration of sugar, you can reach very high alcohol concentrations. Is this realistic? Can you improve the model?