X-Ray Calc

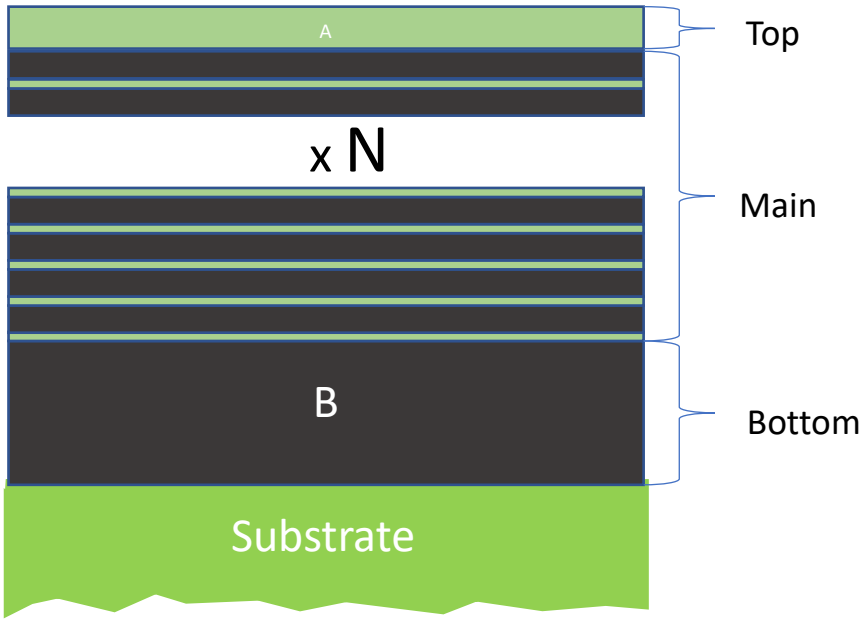
v. 2.4

CREATING A MODEL

Tutorial

This document briefly describes the creation of new models in X-Ray calc. The model represents a layered structure, which also could be periodical. The model consists of a substrate and at least one *Stack*. The Stack is the group of layers.

The following figure demonstrates the general structure of a model of a typical periodical X-Ray mirror.



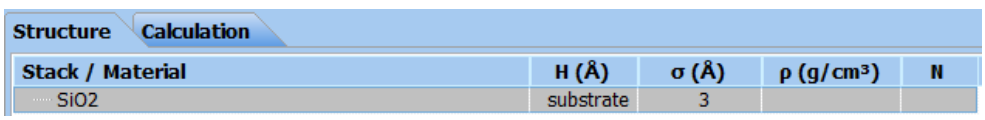
The model above consists of three stacks – Top, Main, and Bottom. Top and Bottom stacks consists of single layers of materials A and B respectively. Main Stack consists of alternated layers of materials A and B. A/B pairs in Main Stack repeated N times.

Commands on ***Stack*** and ***Layer*** panes could be used to manipulate elements of the structure. Some commands could be called from the right-click menu.

Note: Editing of layers in the model. To change the properties of any layer or Stack, double-click, or select the layer and press ***Enter***, or right-click and select ***Edit*** from the pop-up menu, or press *Ctrl+E*.

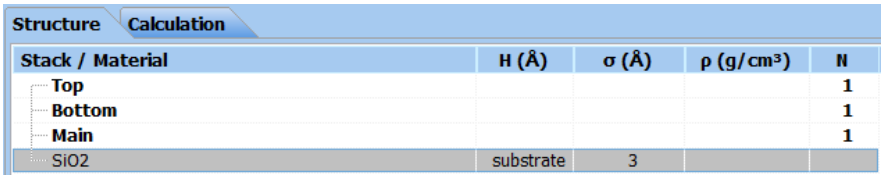
To create such a model in X-Ray calc, do the following steps:

1) Click on the ***New Model*** button at ***Project items*** pane. The new model will be created. It contents only default substrate. Double-click on the Substrate layer and change the Material to

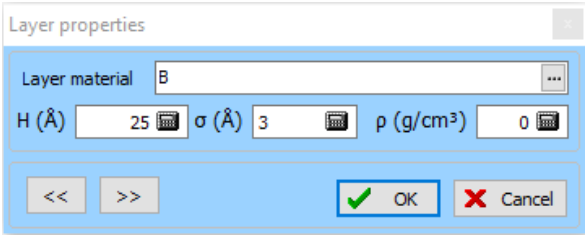


SiO_2 and set roughness to 0.3 nm. Because the default density of SiO_2 will be used, leave the field ρ empty.

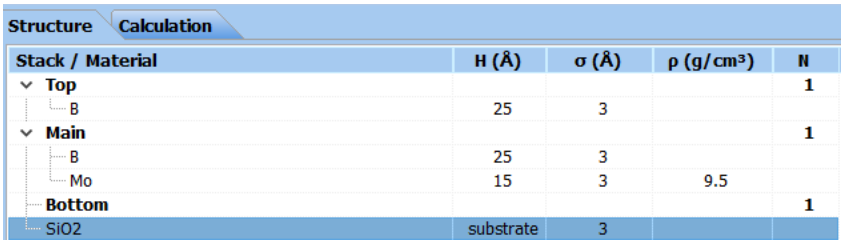
2) Add stacks. Click ***Add*** on the pane ***Stack*.** In the dialog, enter the name of a new stack ("*Top*"). Repeat for stacks "Main" and "Bottom."



3) Select the top Stack. Click ***Add*** on the ***Layer*** panel. The new Si layer will be added to the Stack. Double click on the layer and change its properties as follows: Material – B; Thickness – 25; Roughens - 3; Density – empty. Click Ok.



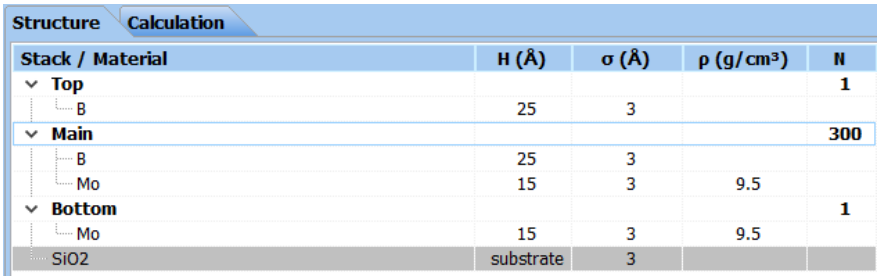
4) Select the stack "Main." Add Mo and B layers to the stack "Main" as follows:
5) Select the Mo layer. Click ***Copy*** on ***Layer*** pane. Then select the stack "Bottom" and click ***Paste*** on the ***Layer*** panel. Double-click on the Mo layer in the stack "Bottom" and increase its thickness to



100.

6) Double click on the stack "Main" and set *N* to *300*.

The final structure looks as follows:



Press **F5** to immediately compute the GIXR curve for this model.