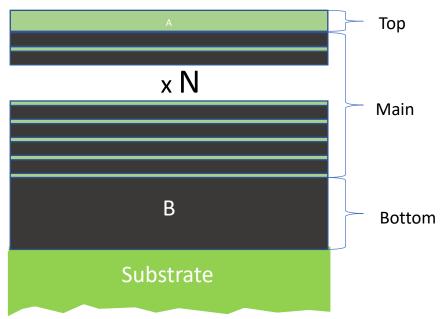
X-Ray Calc

v. 2.4

CREATION A MODEL Tutorial

This document briefly described 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 next figure demonstrates the general structure of a model of a typical periodical X-Ray mirror.



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

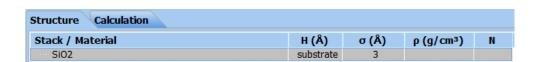


Commands on *Stack* and *Layer* panes could be used to manipulate elements of the structure. Some commands could be called from the right-click menu.

Note: Editing of layers in the model. To change 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*.

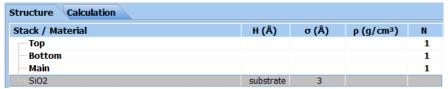
To create such a model in X-Ray calc, do the following steps:

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

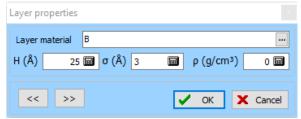


 SiO_2 and set roughness of 0.3 nm. Because the default roughness of SiO_2 will be used, leave the field ρ empty.

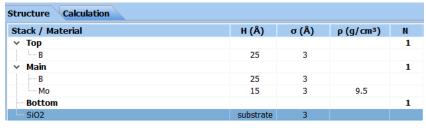
Add stacks. Click Add on the pane Stack. In the dialog, enter the name of a new stack ("Top").
 Repeat for stacks "Main" and "Bottom."



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.



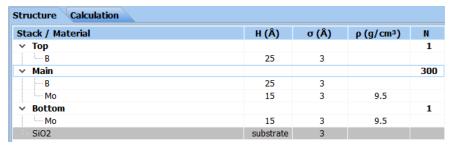
- 4) Select the stack "Main." Add Mo and B layers to the stack "Main" as follows:
- 5) Select the Mo layer. Click *Copy* on *Layer* pane. Then select the stack "Bottom" and click *Paste* on the *Layer* panel. Double-click on the Mo layer in the stack "Bottom" and increase its thickness to



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.