A short manual for

Överlåtaren

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June 8, 2016

Abstract

'Överlåtaren' is a software package for the visualisation and orthogonalisation of offspecular reflectivity data. The program takes advantage of repeatable instrument settings to increase numerical efficiency. For a scientific discussion, please see UNKNOWN JOURNAL 2016
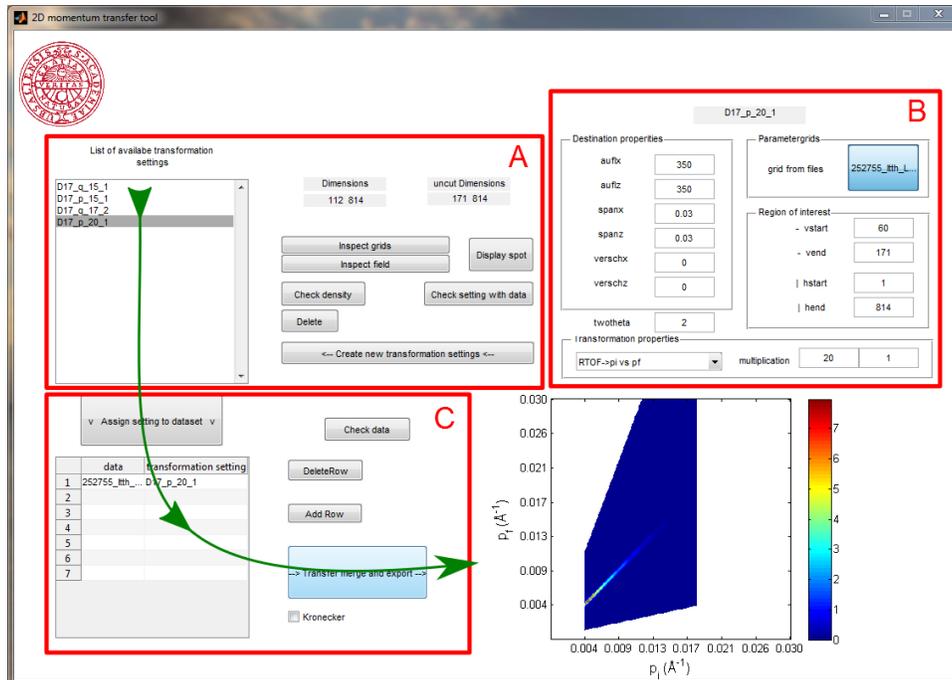
Figure 1: General layout partition(red) and workflow(dark green) of the program packages interface.

1 First steps

For compatibility please download the corresponding MCR version as indicated in the readme under http://www.mathworks.com/products/compiler/mcr/index.html

As seen in figure 1 the interface is roughly devided in 3 parts that are discussed in the following subsections. The workflow follows the dark green arrow.

The program should be executed as administrator or be started from a path with writing permissions, otherwise making adjustments is impossible!

1.1 Available transformations (A)

All available transformations are displayed as data operators in the upper left corner of the programm interface (marked as section 1 in figure 1). The buttons on the right side of section A visualize the properties of the marked settings.

It is necessary to keep in mind that the properties of a transformation setting can not be changed without creating a new set.

1.2 Settings (B)

This section is expert use only. The settings will be provided by the beamline scientist. In B all the transformation settings and the properties of source and destination space are displayed and the parameters for a new set are entered.

By entering new values and loading new axes/grids for the source space, it is possible to push the big button in section A and create a new transformation set.

multiplication Sets the parameter for the point duplication in the y and x direction of the source space $\in \mathbb{N}$.

resx The resolution (i.e. number of bins) in x direction in the destination space

resz The resolution (i.e. number of bins) in z direction in the destination space

spanx The range of the destination space in x direction

spanz The range of the destination space in z direction

dispx The starting point of the range in x direction

dispz The starting point of the range in z direction

pop-down The menu entries are self explaining the type of the transformation

gridbutton By pushing this button typical grids for the source space can be loaded. The text depicts the corresponding reference

vstart, vend, hstart, hend Provide the option to define a region of interest to zoom in and save numerical resources. With very big datasets it might be beneficiary dividing the operation in several parts and then merge consecutively.

1.3 Data Input (C)

The bottom left corner of the program interface allows to select the input data set (left table column) as well as the transformation it should be subjected to (right table column). In order to choose a transformation here it has first to be defined in the top left corner of the interface in figure 1. It is necessary to mark the required setting and the place in the list. For merging operations the destination space settings must naturally be the same. When all of the sets are chosen correctly the big button starts the transfer and merging routine. A dialog window to ask for the result name and folder will open. The 'Kronecker' check-box provides an option to skip the Voronoi tessellation to increase speed for contracting transformations. The 'Mark zeros' checkbox whitens the singular or zero information pixels.

2 Data output

Every data set can be given a name. If the name is already taken it appends automatically a 5 digits random number to avoid data loss. All data sets are exported as mat, hdf5, jpg and txt files in a writeable folder of the users choosing (Default 'C:\Users\public\momentumtransfer2D'). Following intuitively named data (in this order for txt files) are saved.

qmap   The resulting data 2D map of the transforming and merging operation

logqmap   The logarithm of qmap

gridx   A 1D field depicting the values for the bins in x direction

gridz   A 1D field depicting the values for the bins in z direction

mask   The mask corresponding to qmap, showing valid (i.e. non-singular and non-undefined points)

logmask   The mask corresponding to qmap, showing valid (i.e. non-singular and non-undefined points)

3 Data format

Since the development platform of the interface was MATLAB Ⓡ , the standard input format is '.mat' which is additionally accessible over NumPy, SciPY, GNU-Octave and Wolfram's Mathematica Ⓡ .
In case 'hdf5' is used, the dataset needs to be under '/entry1/data1/DATA' and the mesh-grids combined in '/entry1/data1/Y' for α_i and '/entry1/data1/X' for α_f or λ.
Plain ASCII text works as well as supported format.

In case of questions or in the need of support ask your local contact or beamline scientist. With serious issues write an email to franz.adlmann@physics.uu.se