Conference

SUNBIM: a package for X-ray imaging of nano- and biomaterials using SAXS, WAXS, GISAXS and GIWAXS techniques.

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SUNBIM (supramolecular and submolecular nano- and biomaterials X-ray imaging)[1] is a suite of integrated programs which, through a user-friendly graphical interface, are optimized to perform a number of functions, such as: centering, q-scale calibration, two-dimensional to one-dimensional folding of small- and wide-angle X-ray scattering (SAXS/WAXS) data, also in grazing-incidence (GISAXS/GIWAXS), indexing of two-dimensional GISAXS frames and extraction of one-dimensional GISAXS profiles along specific cuts, quantitative scanning microscopy.

SUNBIM consists of five main programs:

1. Calibration package, a set of functions allow one to find all of the geometrical parameters needed to extract a one-dimensional profile out of a two-dimensional image;
2. Batch Script & 2D Mesh Composite, to prepare batch script files (ASCII files) to run a sequential acquisition of two-dimensional frames (in scanning mode) and to perform a composite of the as-collected two-dimensional SAXS frames into a single image;
3. Multi-scan SAXS and WAXS data analysis, to fold each two-dimensional frame of the mesh into a one-dimensional profile and extract all the relevant features of the sample with a multi-modal imaging approach[2];
4. Single-scan (GI)SAXS and (GI)WAXS data analysis, to calibrate and fold the two-dimensional data, in order to extract relevant information from the experimental data and to fold 2D data into 1D profiles;
5. One-D Data Analysis Manager, to manage with one dimensional profiles and import, trigger, save and export plots.

SUNBIM combines in the same package both originally developed algorithms (denoising, beam centering etc.) and reliable methods documented in the literature (multi-modal imaging, GISAXS three-dimensional frame indexing). SUNBIM is developed in the MATLAB language and it will be distributed free of charge to the academic user (downloadable after a valid registration from http://www.ba.ic.cnr.it/softwareic/sunbim/).

Riferimenti

1 D. Siliqi, L. De Caro, M. Ladisa, F. Scattarella, A. Mazzone, D. Altamura, T. Sibillano, C. Giannini, *SUNBIM*: a package for X-ray imaging of nano- and biomaterials using SAXS, WAXS, GISAXS and GIWAXS techniques, Journal of Applied Crystallography 49 (3) (2016) 1107–1114. doi:10.1107/S1600576716006932.

2 O. Bunk, M. Bech, T. H. Jensen, R. Feidenhans'l, T. Binderup, A. Menzel, F. Pfeiffer, Multimodal x-ray scatter imaging, New Journal of Physics 11 (12) (2009) 123016. doi:10.1088/1367-2630/11/12/123016.

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