JOURNAL OF SYNCHROTRON RADIATION

JSR — Synchrotron

Volume 25 (2018)

Supporting information for article:

Quick X-ray reflectivity using monochromatic synchrotron radiation for time-resolved applications
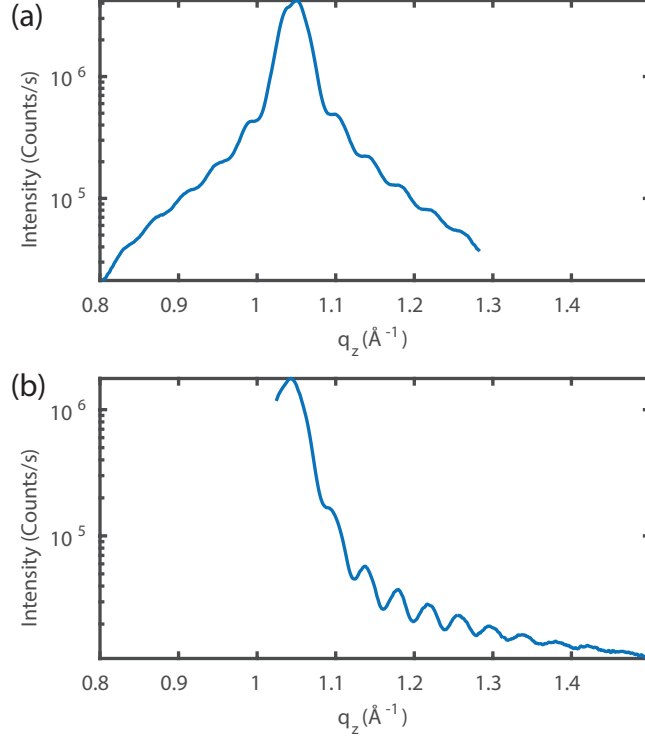
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Fig. S1: Two different qXRR traces of BRO film on YSZ (same film as Fig. 7(a) and (b)). The two traces are taken with different θ_0 angles. (a) is at measured with $\theta_0 =$5.18 ° such that the film Bragg peak is centered in the measured range. (b) is measured at a higher θ_0 of 6.28° such that the film Bragg peak is at the edge of the measured range. The different position of the Bragg peak along with the strong diffuse scattering extending from it parallel to the sample surface has a strong effect on the amount of background under the qXRR signal. In (a) the diffuse at the $\vec{q_z}$ of the Bragg peak is contributing to background for the all the other $\vec{q_z}$-values that are in the measured range and is damping out the Kiessig oscillations. In (b), since the Bragg peak is at the edge of the measured range, the bounds of integration for most of the $\vec{q_z}$-points in the curve do not include this strong diffuse scatter and therefore the Kiessig fringes are much stronger.
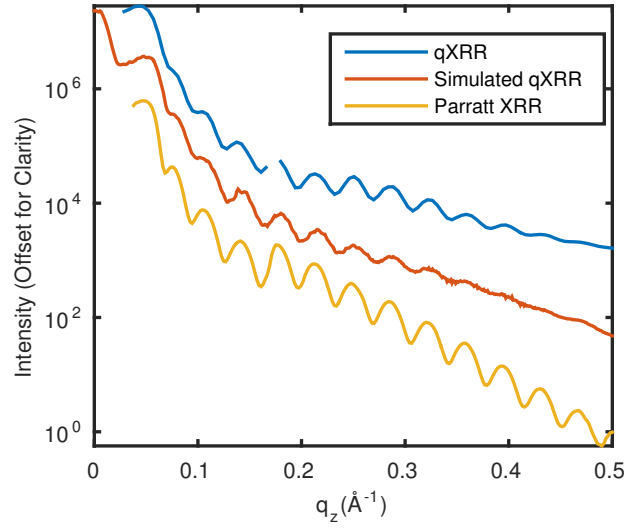
Fig. S2: A demonstration of the effect of diffuse scatter on the qXRR curve. We can reconstruct the qXRR data from the Parratt XRR data. For each point in the Parratt scan we have a detector image that includes a portion of the diffuse scatter generated at each incident angle. By offsetting and summing these images, including this diffuse background, in the correct manner, we can simulate the qXRR detector image. Subsequently we can extract a simulated qXRR curve, shown here, that incorporates the background caused by the diffuse scatter.