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Supporting information for article:

Low-background neutron reflectometry from solid/liquid interfaces

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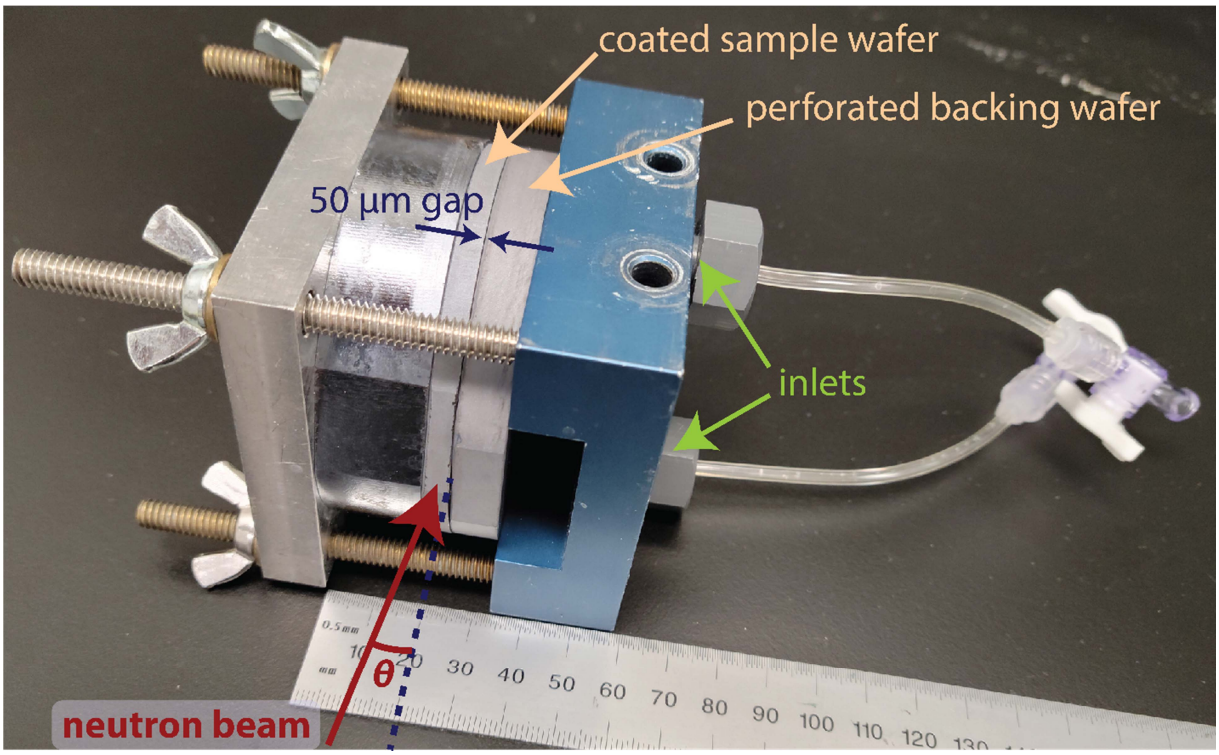

Figure S1. Image of the reflectometry cell showing the backing wafer at $\gamma = 0°$ *and the sample wafer rotated to* $\gamma \approx 20°$.

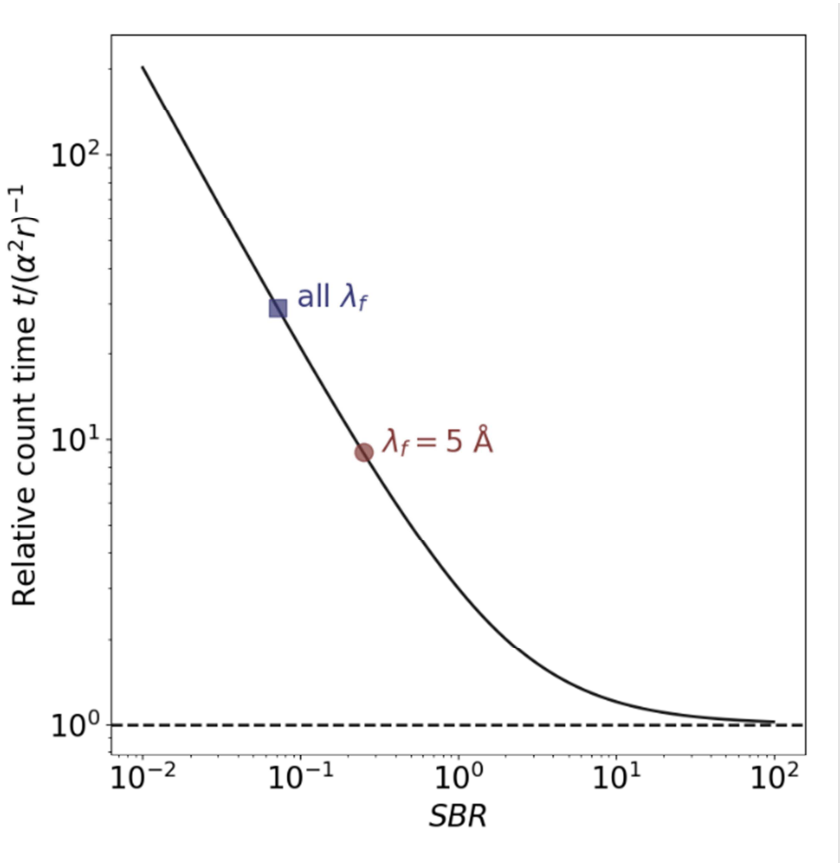

Figure S2. Counting time relative to the background-free case as a function of signal-to-background ratio (SBR). "All λ_f" (analyzer out) and "$\lambda_f = 5$ Å" (analyzer in) refer to the SBR for reflectivity data for a flow cell containing D_2O, assuming a true reflectivity of 10^{-7} and the background levels observed in the inset to Figure 2A. In the low SBR regime, the count time is reduced proportionately to the improvement in SBR.

Table S1. Model parameters for MAGIK (**Figure 2**) and CANDOR (**Figure 7**) measurements of a SiO_2 thin film on a silicon substrate in the liquid cell. For the "all λ_f" measurements on MAGIK (analyzer out), only data with $Q_z < 0.25$ Å^{-1} were used. The model was optimized simultaneously to data collected with D_2O and H_2O in the liquid reservoir. Data are presented as median values followed by brackets representing 68% confidence intervals based on the posterior distributions. Backgrounds are "residual" after a background subtraction correction is applied by linear interpolation.

Parameter	**Range**	**MAGIK (all λ_f)**	**MAGIK ($\lambda_f = 5$ Å)**	**CANDOR**
D_2O residual background	$[-1, 1] \times 10^{-6}$	$-1.01[-1.57, -0.47] \times 10^{-7}$	$4.7[-1.1, 9.4] \times 10^{-9}$	$-1.38\ [-1.53, -1.22] \times 10^{-8}$
H_2O residual background	$[-1, 1] \times 10^{-6}$	$3.7\ [1.9,5.4] \times 10^{-7}$	$2.17\ [1.85,2.47] \times 10^{-7}$	$0.6\ [-3.5, 4.6] \times 10^{-9}$
Intensity correction	$[0.88, 1.05]$	$0.9822\ [0.9800, 0.9845]$	$0.9692\ [0.9667, 0.9718]$	$0.9814\ [0.9789, 0.9837]$
Sample broadening correction (°)	$[-0.01, 0.02]$	$0.00255\ [0.00211, 0.00300]$	$-0.00084\ [-0.00141, -0.00030]$	$-0.0052\ [-0.0087, -0.0005]$
Silicon roughness (Å)	$[2, 15]$	$4.06\ [3.24, 4.77]$	$3.39\ [2.71, 4.00]$	$4.72\ [4.55, 4.89]$
SiO_2 roughness (Å)	$[2, 15]$	$3.67\ [3.22, 4.08]$	$3.93\ [3.69, 4.17]$	$3.590\ [3.512, 3.671]$
SiO_2 nSLD (10^{-6} Å^{-2})	$[3, 4]$	$3.594\ [3.587, 3.601]$	$3.576\ [3.568, 3.584]$	$3.668\ [3.661, 3.674]$
SiO_2 thickness (Å)	$[120, 160]$	$122.88\ [122.61, 123.15]$	$122.14\ [121.87, 122.40]$	$124.22\ [124.13, 124.31]$
D_2O nSLD (10^{-6} Å^{-2})	[6,6.4]	$6.3117\ [6.3088, 6.3145]$	$6.3163\ [6.3133, 6.3193]$	$6.3166\ [6.3136, 6.3193]$
H_2O nSLD (10^{-6} Å^{-2})	$[-0.566, 0.1]$	$-0.5617\ [-0.5648, -0.5550]$	$-0.5620\ [-0.5650, -0.5554]$	$-0.219\ [-0.239, -0.199]$
Reduced χ^2	--	1.219(54)	1.406(42)	1.594(59)