Electronic Supplimentary Information for:
Diffusion in single supported lipid bilayers studied by quasi-elastic neutron scattering

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Resolution Fitting Procedure

The 240 K low teperature data was used as the resolution for this experiment. This data was fit with an asymmetric Gaussian function to accomodate the slight asymmetry in the resolution of the BASIS spectrometer. This function was introduced by Lan and Jorgenson (2001). The asymmetry in the Gaussian is introduced by incorporating an exponential function into one side of the Gaussian peak, as shown by the following equation[1]:

$$y = y_o + H(x_o - x)Ae^{-\left[\frac{(x-x_O)^2}{2\sigma^2+\tau|x-x_O|}\right]} + H(x - x_o)Ae^{-\left[\frac{(x-x_O)^2}{2\sigma^2}\right]}, \qquad \textbf{(1)}$$

where y_o is the constant background, H is a Heavyside function, x_o is the center of the Gaussian function, A is the amplitude of the Gaussian, σ is the varience, and τ is the time constant of the exponential decay, which determines the asymmetry.

For each q value, the low temperature data were fit using Equation (1). The resolution was then used to fit the high temperature data.

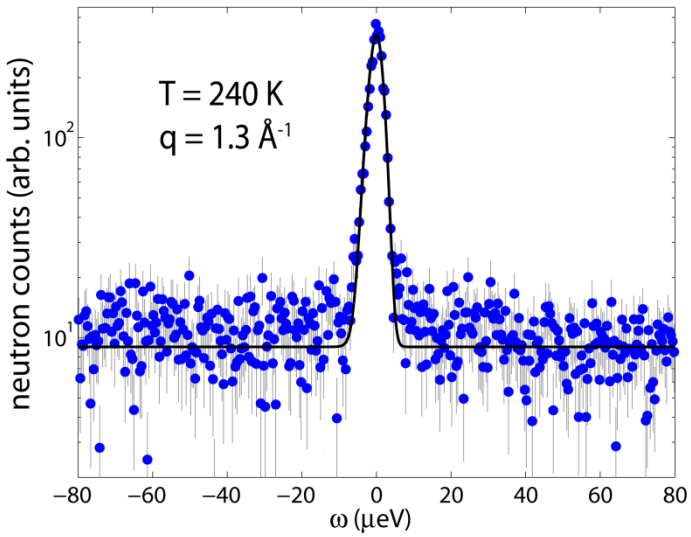

Figure ESI-1: Data obtained from the 240 K low temperature lipid sample at q = 1.3 Å^{-1} plotted on a log scale. The data was fit using the asymmetric Gaussian function described in the text. The resolution function is then used to fit the high temperature data.

Sample can with uncoated wafers

Prior to measuring the sample, data was taken on the aluminum can filled with uncoated Si wafers as a control sample. The results of this data collection are plotted on the same graph as the low temperature resolution and fit, in Figure ESI-2. It was found that this control sample showed no quasi-elastic scattering. When compared to the low temperature data, about 65% of the elastic signal stems from the substrates. The sample bilayers contribute about 35% to the scattering signal.

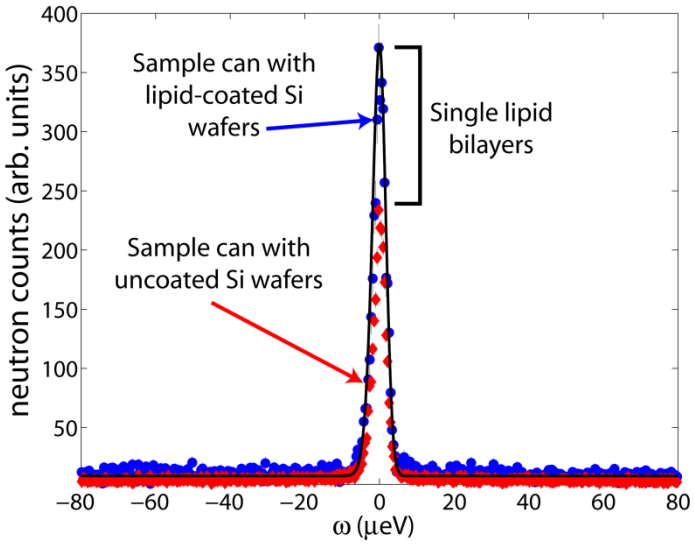

Figure ESI-2: Data from the low temperature lipid-coated Si wafers (blue) and the uncoated Si wafers (red) in the aluminum sample can. The lipid coated sample has a higher intensity elastic peak due to the additional contribution of the frozen dynamics of the lipid system.

[1] K. Lan and J.W. Jorgenson, *J. Chromatogr. A,* 2001, **915**, 1-13