

## Letter to the Editor

### Reply to "Comments on the Existence of Measured Discontinuity in the Thermal-Neutron Diffusion Coefficient Across the Ice-Water Phase Transition"

In his letter, Williams<sup>1</sup> states "In a Technical Paper Salaita and Robeson<sup>2</sup> state that their measurements in D<sub>2</sub>O ice in conjunction with earlier measurements in H<sub>2</sub>O ice and water support arguments for the probable existence of a discontinuity in the thermal-neutron diffusion coefficient across the phase transition for H<sub>2</sub>O, independent of density effects."

I would like to point out that a careful review of the paper will show (a) that the results give no evidence of a discontinuity in the value of D<sub>0</sub> across the D<sub>2</sub>O phase transition, and (b) the probable existence of discontinuity in D<sub>0</sub>

across the H<sub>2</sub>O phase transition was based on results of measurements we performed on H<sub>2</sub>O near the freezing point (1°C) and in ice at -20°C. Thus we did not extrapolate from room temperature. The method of evaluating the probable discontinuity in D<sub>0</sub> across the H<sub>2</sub>O phase transition was similar to that used by Silver.<sup>3</sup>

We do, however, agree that improved accuracy in neutron diffusion measurements is highly desirable. Further, a uniform and consistent method of data evaluation might assist in removing discrepancies and indeed in appraising the validity of theoretical models.

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<sup>1</sup>P. M. Williams, *Nucl. Sci. Eng.*, **47**, 389 (1972).

<sup>2</sup>G. N. Salaita and A. Robeson, *Nucl. Sci. Eng.*, **46**, 214 (1971).

<sup>3</sup>E. G. Silver, *Nucl. Sci. Eng.*, **34**, 275 (1968).