

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Possible Phase Transition in H<sub>2</sub>O Ice Ih near 110 K<sup>1</sup>** DAVID T. W. BUCKINGHAM, SUELI H. MASUNAGA, FORREST C. GILE, JOHN J. NEUMEIER, Montana State University — The thermal expansion of single-crystalline H<sub>2</sub>O ice Ih was measured with  $\sim 10^4$  times greater relative resolution than has previously been done. Plots of the thermal expansion coefficient,  $\mu$ , along the a- and c-axes reveal features which have *never before been observed* in thermal expansion measurements of H<sub>2</sub>O ice:

- A jump in  $\mu$  of magnitude  $\Delta\mu \approx 10^{-5} K^{-1}$  in the temperature range 98–117 K along the c-axis, which appears to be a phase transition. No such transition is observed along the a-axis.
- Hysteresis of the transition temperature,  $T_c$ , of as much as 5 K for cooling rates from -5.0 to -0.1 K/min.

There is reason to believe this transition is the ferroelectric transition reported by Dengel et al.<sup>2</sup> If so, the shift in  $T_c$  would result from the freezing-in of the H<sub>2</sub>O molecular configurations. We will discuss our own measurements of the dielectric constant in the vicinity of  $T_c$ .

<sup>1</sup>This work is supported by NSF Award DMR-1204146.

<sup>2</sup>Dengel et al., *Physics Letters*, **9**, pp. 291-292, 1964.

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Date submitted: 14 Nov 2014

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