Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

**Freezing kinetics in overcompressed water**[1] MARINA BASTEA, S. BASTEA, J. REAUGH, D. REISMAN, Lawrence Livermore National Laboratory — The transformation of water into ice is among the most common first order phase transitions occurring in nature, but it is far from being an ordinary one. Water has unusual physical properties both as a liquid and as a solid due largely to hydrogen bonding effects, which also play a major role in determining the characteristics of its freezing kinetics. We report high pressure dynamic compression experiments of liquid water along a quasi-adiabatic path leading to the formation of ice VII. We observe dynamic features resembling Van der Waals loops and find that liquid water is compacted to a metastable state close to the ice density before the onset of crystallization. By analyzing the characteristic kinetic time scale involved we estimate the nucleation barrier and conclude that liquid water has been compressed to a high pressure state close to its thermodynamic stability limit.

[1]This work was performed under the auspices of the U. S. Department of Energy by University of California Lawrence Livermore National Laboratory under Contract No. W-7405-Eng-48.

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Date submitted: 16 Nov 2006 Electronic form version 1.4