Abstract Submitted
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Growth of Solid ^{4}He from the Superfluid ROBERT HALLOCK, MICHAEL RAY, University of Massachusetts — We have previously reported on the observation of random, transient events during the growth of solid ^{4}He crystals from the superfluid at constant temperature [1,2]. The solid is grown by injecting mass into an experimental cell [2] through two Vycor rods, which allows us to continue to add mass to the solid at pressures greater than the bulk melting pressure. The observed events occur at pressures greater than the melting pressure, but less than ~ 26 bar, and are seen as drops in pressure (measured at the ends of the solid), $\Delta P \leq 150$ mbar, accompanied by temperature transients, $\Delta T \leq 9$ mK. These events may be the solidification of meta-stable liquid regions embedded in the solid that were at the same pressure as the solid. Additional analysis now includes the possibility that the liquid regions are instead at the melting pressure, and that there exists a strain field in the solid which disappears when the liquid solidifies. We will show examples of these events, and report on this new analysis. Our experiments are supported by the NSF via DMR 08-55954.

[1] M.W. Ray and R.B. Hallock, J. Phys.: Conf. Ser. **150**, 032088 (2009).
[2] M.W. Ray and R.B. Hallock, Phys. Rev. B **79**, 224302 (2009).

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