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Search for dislocation free ^{4}He crystals[1] FABIEN SOURIS, ANDREW FEFFERMAN, ARIEL HAZIOT, CNRS et LPS de l'ENS, Paris (France), JOHN BEAMISH, Physics Department, University of Alberta, Edmonton (Canada), SEBASTIEN BALIBAR, CNRS et LPS de l'ENS, Paris (France) — The elastic anomaly of ^{4}He crystals is known to be a consequence of the motion of their dislocations. We have built an acoustic cell in order to grow and study crystals with the smallest possible density of dislocations. It has a polished inner surface to avoid pinning sites for the liquid-solid interface. Piezoelectric transducers are placed outside the cell volume, in order to drive and detect acoustical resonances through built-in copper membranes.
We expect dislocation free crystals to behave rather differently from the usual ones (1,2). For example, they should not show any anomalous softening. Preliminary results show that crystals grown in this particular cell have longer dislocation lengths than in those studied in previous experiments (1,2). Centimeter long dislocations should resonate below 20 kHz.

1- A. Haziot *et al.*, Phys. Rev. Lett. 110, 035301 (2013), Phys. Rev. B 87, 060509(R) (2013), and Phys. Rev. B 88, 014106 (2013).
2- A. D. Fefferman *et al.*, submitted to Phys. Rev. B, Nov. 2013.

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