**Lab log**

**Date:** 7/18/2013

**Info:** --

**Conditions:** BSE, 15 kV, PC 60, 50 Pa, Wd 6 -> ~9.8 mm tech.

**Goal:**

1. Aquire roughness images from -20 °C, -25 °C, … with 5 mins on them and then jumping back to ~-33 °C.

**What I did:**

1. Standard start, go to -45 °C, wait for crystals to start to appear.
2. Quickly go for -33 °C, find a good crystal.
3. Zoom-in on roughness and align it with rotation, go to -30 °C
4. T: -30, wait 5 mins, snapshot -> T: -33, snapshot
5. Repeat with -25 °C, -20 °C

**Products:**

Only staying on -40 °C until crystals begin to appear seems to do the trick to grow pretty ones. If you grow them too much, you can always go to -10 °C, let them completely melt and then do a quick grow again.

The equilibrium temperature seems to be around -32 °C, it is however very difficult to get it exactly, because f you set the cold stage to -32, it is actually going to report a temperature from -32.9 – 33.1 and that is 1 degree away. So to go for the equilibrium, it seems to be best to set the temperature to -31 °C, which will result in approximately 32 °C and depending on the pressure in the ice not growing/melting. Even if you find the perfect temperature, your roughness can keep changing throughout that.

The planned course of action only worked for -30 °C. When I tried to go for -25/-20 °C, the crystals started disappearing at such a rate it was impossible to stay there for the planned five minutes. I have tried to counter that by only staying there for 10-15 seconds – that is however not fast enough to generate roughness right away, so when you return to the equilibrium temperature, you don’t see any results right away. If you stay on it for a while, some roughness starts to appear, but it is hard to say if that is the -20 °C roughness, or just one that would appear at -32 °C by itself after a while.

It is also very complicated to take 3D pictures of any effects/roughnesses that don’t last longer than a minute, as focusing and setting the 3D image takes more than that and by the time you focus and set everything up, the crystal is going to change, changing roughness and the ideal focused distance. That is why most of the pictures form today did not look too good.

**Info:**

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| Time | Temp taken [°C] | Temp from [°C] | Name |
| 10:07 | -43.2 |  |  |
| 10:10 | -30 | -43 | 1008\_3d\_25\_snp1 |
| 10:15 | -30 | -30, 5 mins | 1008\_3d\_25\_snp2 |
| 10:17 | -32 | -30 | 1008\_3d\_32\_snp1 |
| 10:19 | -26 |  | Crystals disappear, abort! |
| 10:25 | -29 | -30, 20 seconds | 1008\_3d\_29\_snp1 |
| 10:29 | -35 | -29 | 1008\_3d\_29\_snp2 |
| 10:31 | -29 | -35 | 1008\_3d\_29\_snp3 |
| 10:33 | -40 | -29 | 1008\_3d\_29\_snp4 |
| 10:50 | -25 | -40 | 1008\_3d\_25\_snp1 |