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The only one who has never failed at making a TEM specimen is someone who has never tried to make a TEM specimen. - R. B. Irwin (1996)

Problems cannot be solved at the same level of awareness that created them. - Albert Einstein

November 8, 2006

SEND TO: otto.lohne@material.ntnu.no, runechri@stud.ntnu.no, huethai@stud.ntnu.no COPY TO: hans.j.roven@nt.ntnu.no, "jarle Hjelen" <jarle.hjelen@nt.ntnu.no> **The first part discussed WHY a smooth surface is critical for EBSD scan.**

Dear Otte

Nice to discuss with you and Jarle about EBSD background subtraction, and the samplesurface smoothness is so important for getting a meaningful EBSD scan! Since this matter was also talked a lot in our yesterday group meeting, I would like to give your a real example here, together for others reference.

For all our present EBSD systems, before the EBSD scan, the system takes a background from the average of several image frames of this EBSD region. Then during scanning, this averaged background will be deducted from the individual scanned EBSD patterns, to enhance the Kikuchi bands as shown in the attached figure A. If some unsmoothed spots were met, part of the illumination beam would be deflected away. Then the same background deduction would produce a black zone in the final patterns shown in attached B. Maybe in the B case, it still could be auto indexed...However, if more serious beam deflecting, the scanned spot would be treated as uncertain by auto indexing....For the total scanned area, if this type uncertain occupied more than 50% (confidence index below 0.5), this EBSD scan would be meaningless....

So for EBSD sample, both smooth surface and good top crystalline layer are important before deciding to perform the EBSD scan!

We hope every user have a good EBSD sample so that we can help to get the wanted results quickly! However for my feeling, this EBSD sample preparation is quite similar as that of TEM sample, which is time consuming and tedious! For TEM we say, if you have a good meaningful specimen, you are finishing more than 60% of TEM work. In Chinese, we say "the cleverest housewife can't cook a meal without rice" :-)...

Hopefully this information would be helpful for clearness! Regards, Yingda



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The second part discussed WHY a well crystallised layer on the sample surface is critical for EBSD scan.

Hei, Rune and Hue

yesterday with Hue, I checked your EBSD results from the FEG SEM.

I think your big trouble is from the EBSD sample preparations! As we talked, the EBSD patterns are normally from the top surface around 20-50 nm of the specimens, which should be kept well in original crystalline status after your sample preparations! If not, it is no sense to do EBSD scan!

The attached FEG-SEM EBSD example was obtained yesterday from the extruded Al surface, which was prepared by Birgitte Karlsen at the SINTEF Metallographic lab. Maybe you should ask her for more suggestions about how to have a good EBSD sample!

Lykke til!

Regards,

Yingda

http://www.ntnu.no/~yingday

