Okay, so we are going to show you the real time in B is the analysis which is available in IIT Kanpur at the Department of Materials hands engineering this is an microscope which is can do all kinds of PBST analysis the sample is loaded inside this chamber and this is the EVST camera which goes inside whenever we are required to detect the VST article to do the VST analysis and up to reload the sample is basically loaded this kind of holders where you can see this automatic tilt so you do not need to tilt it now days.

This kind of oldest available so sample will be remain tilted in this position at about 65 to 75 degrees and then if I if I show you what is there inside.

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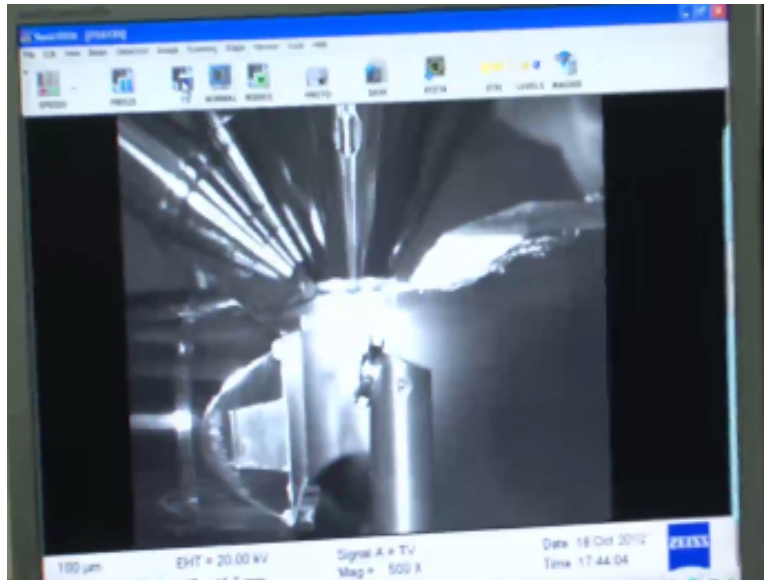
You can see this is a sample holder and the sample is mounted here which is automatically tilted with respect to the horizontal by 65 to 75 degrees and this is the phosphor screen and the camera which goes inside and these are the this is the true is the electron beam falls on the sample and there are other detectors which is attached to any ACM or scanning electron microscope. Now we will just simply go back to the original position that is the sample.

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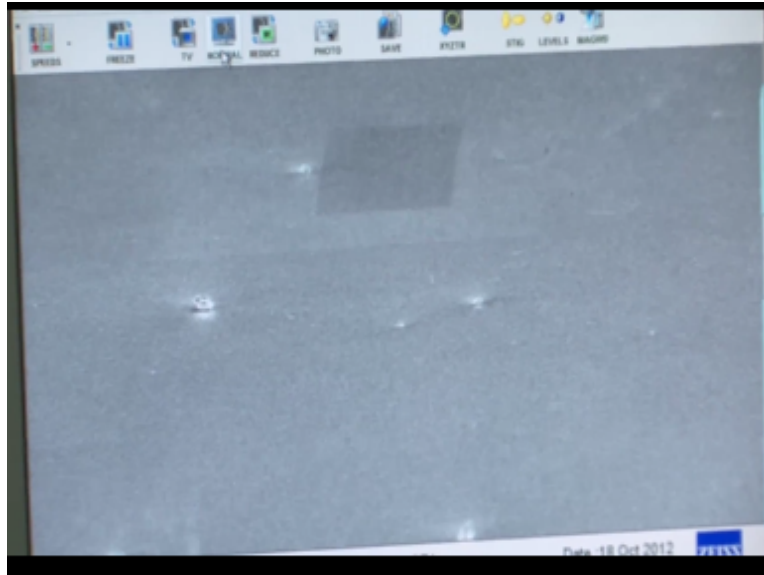
So this is the basket an image obtained when the sample is tilted now once it is there on the computer we can actually take any point on sample and I get an EVST pattern so I will explain you how it is done so now we if we import this image on the computer screen.

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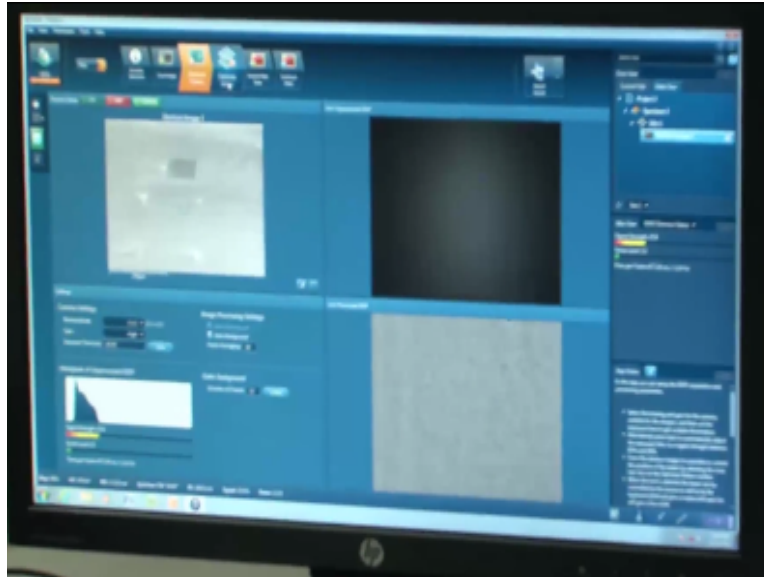
There so as you see the same image is imported there now if we click just the button just mouse here we can immediately get the EVST pattern on a computer screen this is what is the automatic automation nowadays possible to get so this is the unprocessed EVST pattern which is which contain lot of noise are and that needs to be corrected it is aqua getting the EVST pattern actually normally 16 gb HD patterns are collected from one position and they are integrated over the time scale so that the quality of the pattern can be improved and then the background subtraction is done.

To remove the background noise it is now collecting these gv HD patterns from that particular point which is selected on the second electron image on the sorry on the back for electron image and then it is collecting the EVST patterns well so we would like to show you how this is done online in a fully automated system so as you see on the left side of this computer screen.

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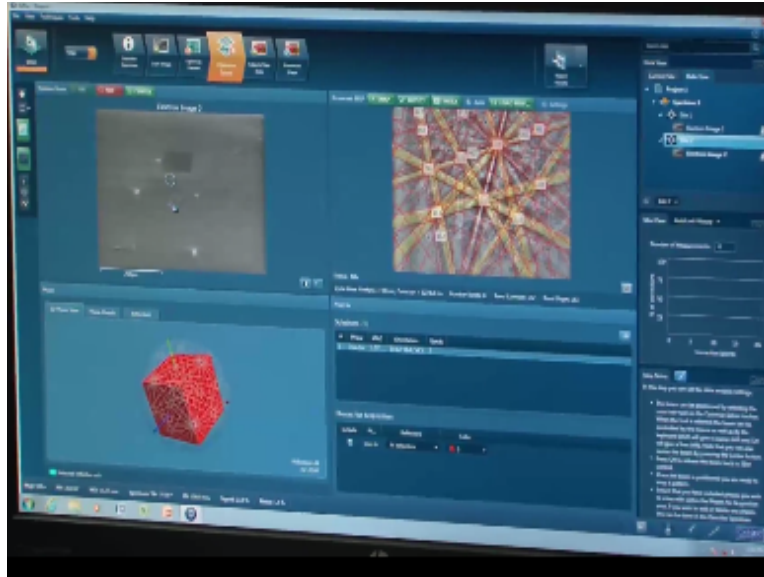
There is an electron micrograph which is basically vascular electron micrograph taken with a sample of tilted to 65 to 75 degrees and then as I click you will see that a pattern will appear on the right side so if I click it here so a pattern appears on the screen and you can see the pattern is even indexed so this is the quality of the BAC pattern one can get nowadays using the this kind of high quality detectors and by knowing this the typical crystal structure of the material we can actually see that even this the orientation of the crystal with respect to the sample.

So from the laboratory frame we can get actually what is the exact orientation of the crystal so if I collect the informations from different grains of the material in there well for a which we have bring the study we can actually get all the informations from each grain and then store it into the computer and finally it is possible in fact.
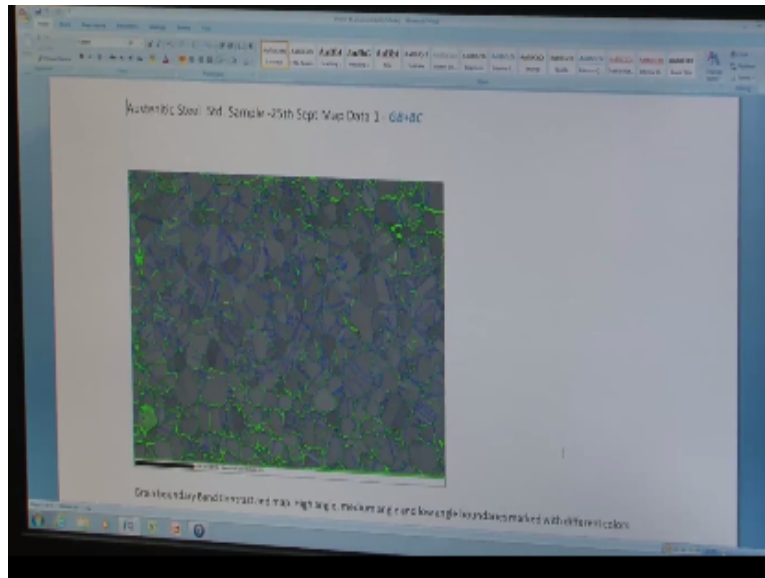
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To show that how the gain this information can processed and again map.

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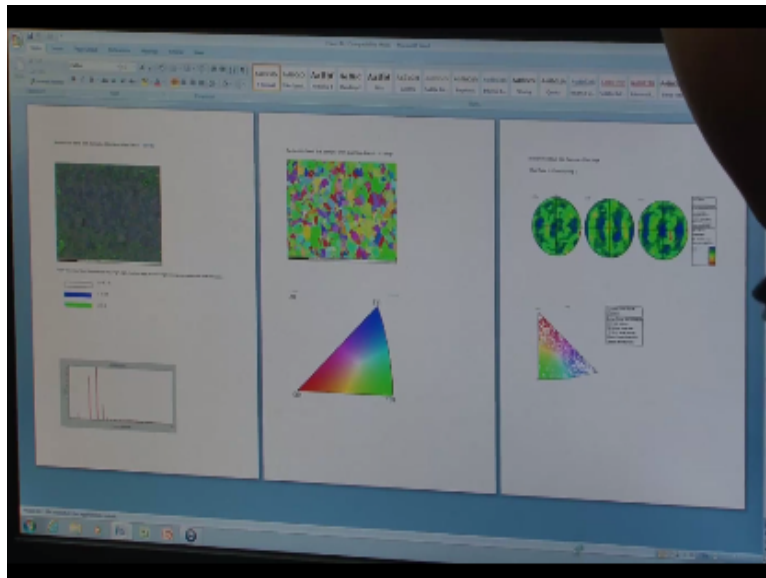
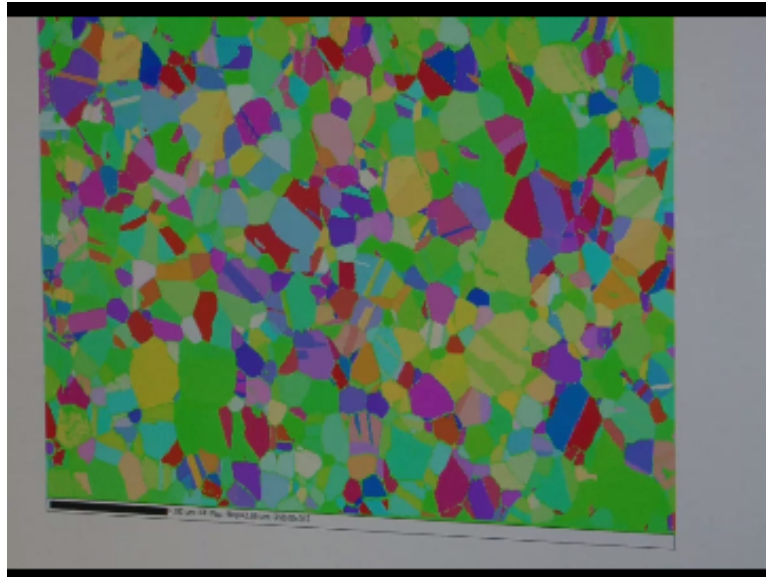Can be obtained which I will show you in a nutshell so suppose.

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This is A synthesis austenitic stainless steel sample. Which is FCC crystal structure and this is the grain different grains in the crystal and once.

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We go down and once you take the information from different grains which are present in the sample after collecting the HD patterns and we can this process in the software and then we can plot it in terms of the gain orientations and this is the quake in the orientations are sown by different colors this each color indicate.
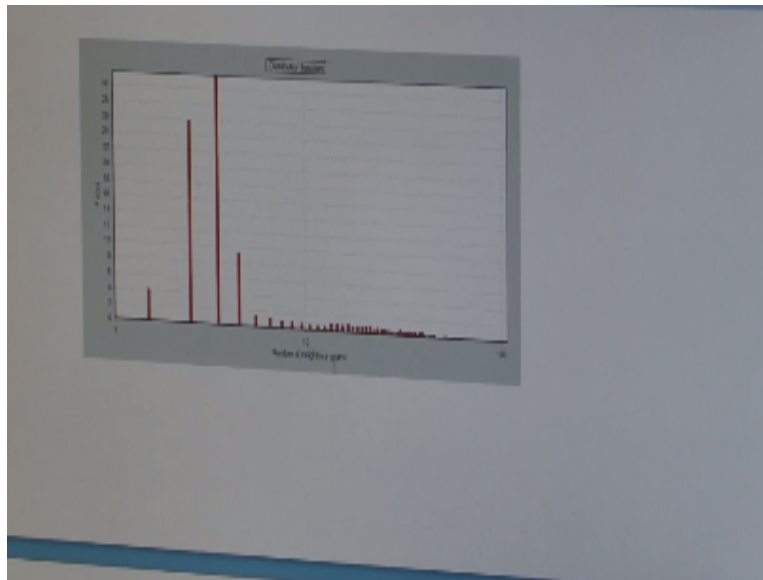
(Refer Slide Time: 05:04)
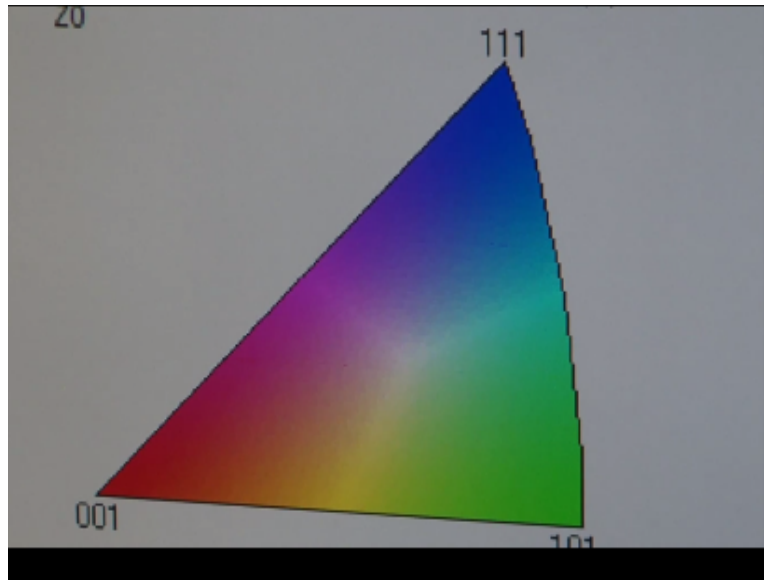
The orientation of the grain as you see the judo one actually is depicted in red color weather 101 is affected in green and one on one is depicted in blue so therefore any grain which is looks like a red is basically close to Jerusalem and orientation whether one grain like this one or this one it can be inferred that they were rented along 011 or 101 orientations on the other end there are grains like this which is blue they are oriented along 111 so therefore in a large number of grains we can collect.

The orientation information from all the grains or over each of these grains and then we can figure out even what is the kind of orientations here.
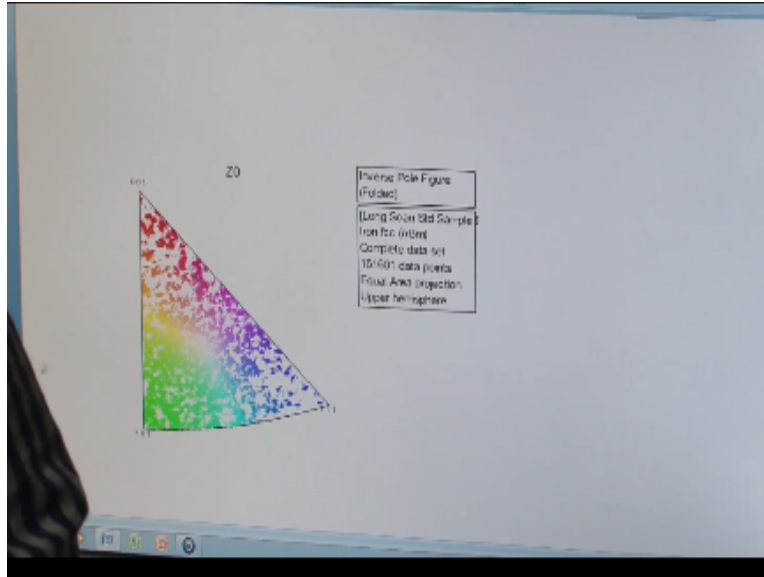
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The fractional number of grains and this is the fraction and this is the number of neighbor against and we can find out the orientations by doing certain analysis.

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And that is what is done in this picture here the poll figures corresponding to 100 110 and 111 are sown and as you can see it is the rest is visibly there is some texture present in the sample and this texture is not so we are clear from these pictures but in the class .I will discuss you each of these cases and I will show you that we can get information and get the this is the structure type or a particular material form such a kind of analysis in fact one can plot.

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One can make a plot in my sport figure 4 like they in which one can show the cluster of the grains with orientations like 0 1 1 0 1 or 1 1 1 and by knowing these orientations the grammar of clusters present a teacher orientation one can get which is the predominant texture as you see here the most of the grains are oriented along 101 so there are large number of green regions close to the 101 on the other hand there are very few blue region close to 111 so therefore very few games are there which are were interred along 111 and that is obvious because in a in a normal material a stainless steel the gain or initially predominantly.

Why the 01 or 1010 one type and so therefore one can actually get such a kind of lots of kind of information from one single run of EVST and this one makes this technique so useful in the real situations where we need to analyze the line number of games and get information regarding their orientations respect to the laboratory frame of frame and also the weather these foreign editions have earth we know random are they are preferred that is whether there is a nice texture present or not this all can be inferred.

From such a kind of analysis such a facility is existing almost every lab almost many labs in India and one can prepare a sample and then just put it inside a microscope and obtain such patterns in a six to eight hours time and then process this information in a software which are available in the market and then infer lot of information's.

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