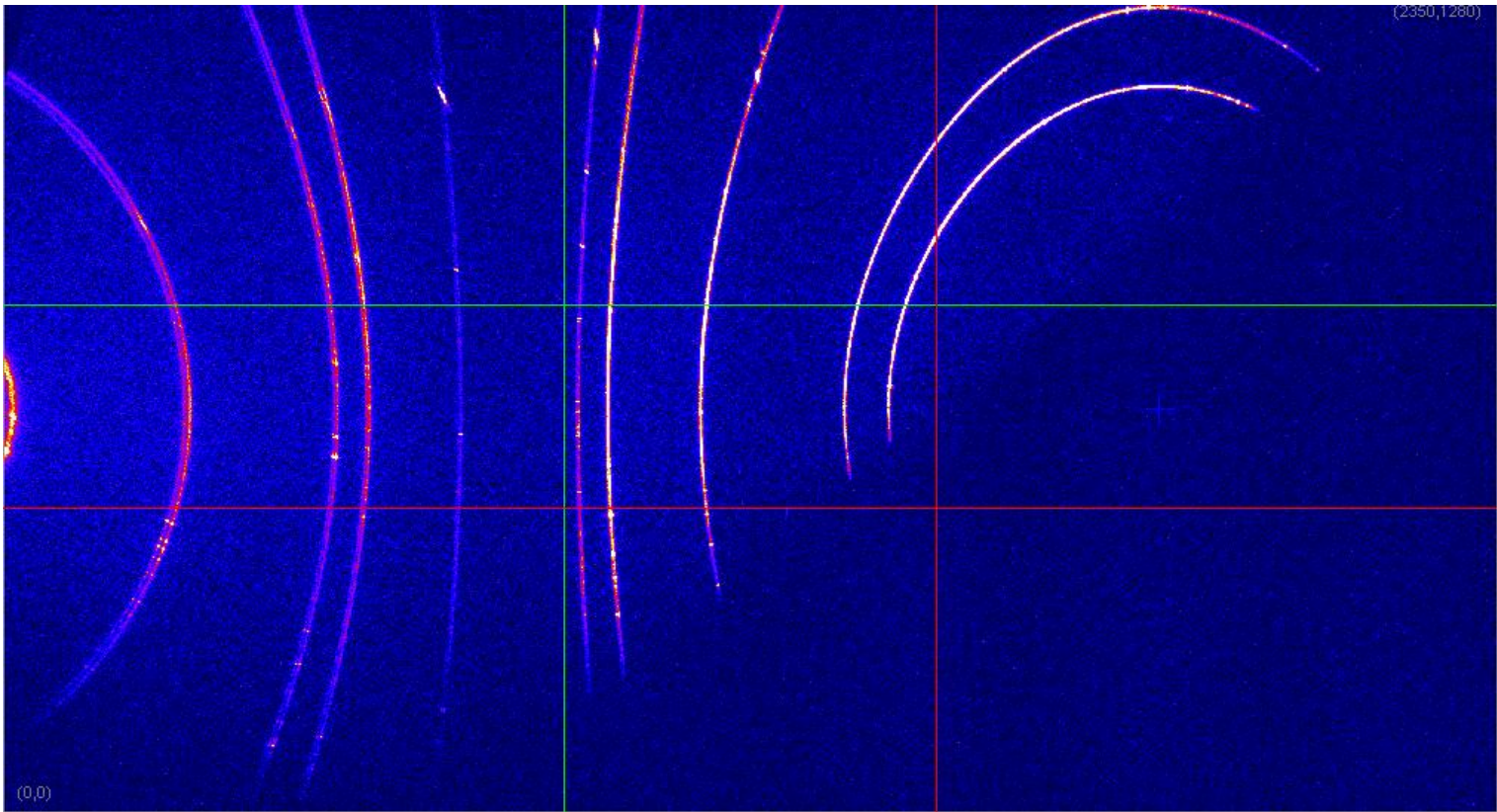


# 2DP極点処理とODF

2DP極点図を最新CTRソフトウェアで処理し、ODF解析  
LaboTex3.0(Ver3.0.5.3)  
MTEX(Ver5.1.1)を使用

2018年10月  
HelperTex Office

# ImageData



ImageDataからASC極点図を切り出す。  
Randomデータからdefocus曲線作成は1deg間隔  
Sampleは5deg間隔(1deg間隔の場合、1deg->5deg処理を行う)

# RAPID->2DP->DATA

RAPID2-007-100 $\mu$ m-FT10sec ▶ 2018-10-03 ▶ random

名前	更新日時	種類	サイズ
111-1deg.asc	2007/06/19 8:24	RINT20007ｽｷ-	263 KB
111-5deg.asc	2007/06/19 8:25	RINT20007ｽｷ-	16 KB
200-1deg.asc	2007/06/18 21:59	RINT20007ｽｷ-	260 KB
200-5deg.asc	2007/06/18 22:00	RINT20007ｽｷ-	16 KB
220-1deg.asc	2007/06/18 21:46	RINT20007ｽｷ-	255 KB
220-5deg.asc	2007/06/18 21:46	RINT20007ｽｷ-	15 KB
311-1deg.asc	2007/06/18 21:50	RINT20007ｽｷ-	256 KB
311-5deg.asc	2007/06/18 21:51	RINT20007ｽｷ-	16 KB

RAPID2-007-100 $\mu$ m-FT10sec ▶ 2018-10-03 ▶ sample

名前	更新日時	種類	サイズ
Alsample111-1deg.asc	2007/06/19 15:11	RINT20007ｽｷ-	253 KB
Alsample111-5deg.asc	2007/06/19 15:11	RINT20007ｽｷ-	15 KB
Alsample200-1deg.asc	2007/06/19 15:15	RINT20007ｽｷ-	258 KB
Alsample200-5deg.asc	2007/06/19 15:15	RINT20007ｽｷ-	16 KB
Alsample220-1deg.asc	2007/06/19 15:31	RINT20007ｽｷ-	252 KB
Alsample220-5deg.asc	2007/06/19 15:31	RINT20007ｽｷ-	15 KB
Alsample311-1deg.asc	2007/06/19 15:33	RINT20007ｽｷ-	252 KB
Alsample311-5deg.asc	2007/06/19 15:33	RINT20007ｽｷ-	15 KB

```
*TYPE = Raw
*CLASS = PoleFig
*SAMPLE =
*COMMENT = Export from Riga
*FNAME =
*DATE =
*GROUP_COUNT = 1
*PF_PCOUNT = 1, 91
*PF_ASTART = 1, 0.0000
*PF_ASTOP = 1, 90.0000
*PF_ASTEP = 1, 1.0000

*BEGIN
*GROUP = 0
*START = 0.0000
*STOP = 360.0000
*STEP = 1.0000
*OFFSET = 0.0
*SPEED = 60.0000
*FULL_SCALE = 1000
*PF_ANGLE = 0.0000
*PF_BANGLE = 0.0000
*INDEX = 1 1 1
*COUNT = 361
0.00 , 0.00 , 0.00 , 0.00
0.00 , 0.00 , 0.00 , 0.00
0.00 , 0.00 , 0.00 , 0.00
```

ファイル先頭は指数から始まる。  
1degデータを用いてdefocus曲線を作成し  
5degデータで極点処理を行う

# randomファイル処理(入力データの確認)

The screenshot displays the ODFPoleFigure2 software interface. At the top, four pole figure plots are shown for different hkl values: {1,1,1} (294.72), {2,0,0} (491.64), {2,2,0} (149.74), and {3,1,1} (92.35). The main window title is 'ODFPoleFigure2 3.82SKT[19/03/31] by CTR'. The 'Files select' dropdown menu is highlighted with a red circle and contains the text 'ASC(RAPID)'. Below this, the 'Calculation Condition' section shows the file path 'C:\CTR\TEST\RAPID2-007-100 μm-FT10sec\2018-10-03\random\111-1degZcut.asc'. The 'Background delete mode' section includes options for 'DoubleMode', 'SingleMode', 'LowMode', 'HighMode', and 'Nothing', along with 'BG defocus' and 'Trans blinds angle' settings. The 'AbsCalc' section includes 'Ref', 'Trans', and 'Schulz reflection method' options. The 'Defocus file Select' section has 'Defocus(1) functions file' selected. The 'Smoothing for ADC' section includes 'Cycles' and 'Weight' settings. The 'Normalization' section has 'CenterData' and 'OutFiles' options. The 'OutFiles' section includes 'Asc', 'MTeXAsc', 'Ras', 'TXT', and 'TXT2' options. The 'Calc' button is visible at the bottom right.

測定されていない領域をCutモード

# randomファイル処理(TXT2作成)

The screenshot displays the ODFPoleFigure2 3.82SKT[19/03/31] by CTR software interface. The top section contains four RD plots with the following hkl values: {1,1,1} 294.72, {2,0,0} 491.64, {2,2,0} 149.74, and {3,1,1} 92.35. The bottom section shows a control panel with various settings. The 'OutFiles' section has 'TXT2' selected. The 'Calc' button is circled in red, and a blue arrow points to it from the left. The status bar at the bottom left indicates 'Filemake success !!'.

Files select: ASC(RAPID) 111-1degZcut.asc 200-1degZcut.asc 220-1degZcut.asc 311-1degZcut.asc

Calculation Condition: C:\CTR\TEST\RAPID2-007-100 μm-FT10sec#2018-10-03#random#111-1degZcut.asc

Background delete mode:  DoubleMode  SingleMode  LowMode  HighMode  Nothing

Smoothing:  +α 7 Savitzky-Golay mean

OutFiles:  Asc  MTextAsc  Ras  TXT  TXT2

Buttons: Calc, Connect, Exit&ODF, ODF, ValueODFVF..., ValueODFVF-A

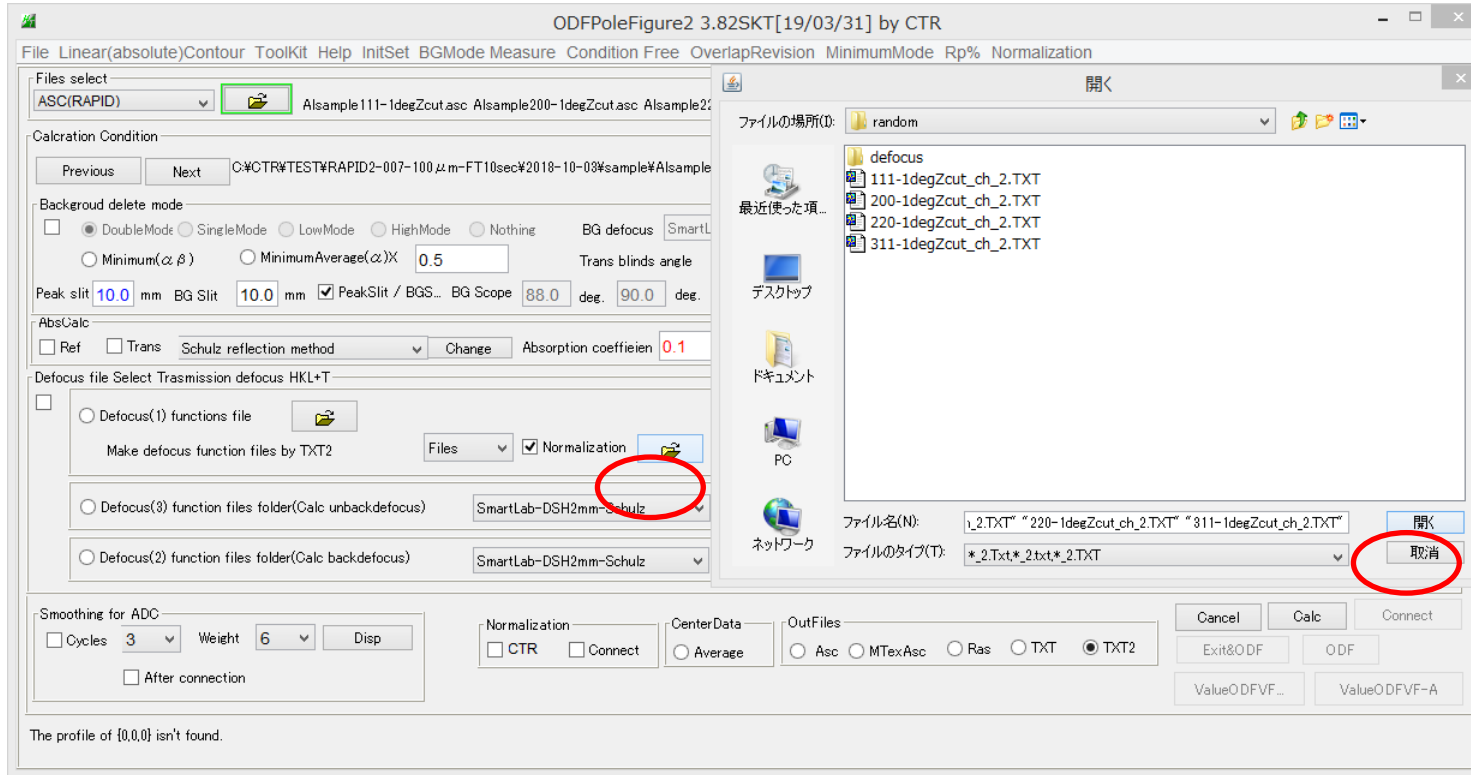
# randomファイル処理(TXT2ファイルの確認)

File Explorer window showing a directory of files. The selected file is `111-1degZcut_ch_2.TXT`. The preview window displays the following data:

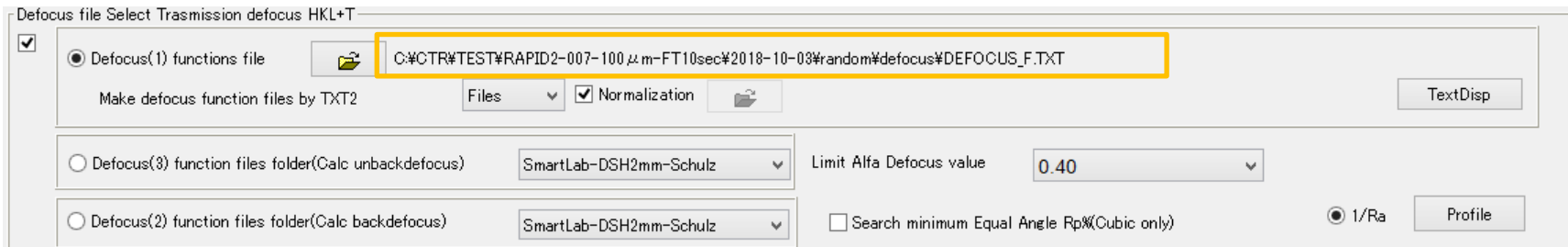
ファイル(F)	編集(E)	書式(O)
35.0	0.0	0.0
35.0	1.0	0.0
35.0	2.0	0.0
35.0	3.0	0.05
35.0	4.0	0.1
35.0	5.0	0.14
35.0	6.0	0.17
35.0	7.0	0.2
35.0	8.0	0.21
35.0	9.0	0.21
35.0	10.0	0.18
35.0	11.0	0.14
35.0	12.0	0.09
35.0	13.0	0.05
35.0	14.0	0.02
35.0	15.0	0.0
35.0	16.0	0.0
35.0	17.0	0.0
35.0	18.0	0.0
35.0	19.0	0.0

ZCutで測定されていない領域が削除される。

# randomファイル処理(TXT2の登録)



## TXT2ファイルを登録する



# Sample処理(指数の確認と登録)

The screenshot displays the ODFPoleFigure2 software interface. At the top, four pole figure windows are open, showing intensity distributions in the RD-TD plane for different Miller indices:  $\{0,0,0\}$  128.29,  $\{0,0,0\}$  43.2,  $\{0,0,0\}$  38.1, and  $\{0,0,0\}$  19.3. The main window title is "ODFPoleFigure2 3.82SKT[19/03/31] by CTR".

The configuration window below shows the following settings:

- Files select:** ASC(RAPID)
- Calculation Condition:** C:\CTR\TEST\RAPID2-007-100 μm-FT10sec#2018-10-03#sample#AIsample111-5degZcut.asc
- Background delete mode:** DoubleMode, SingleMode, LowMode, HighMode, Nothing (selected), Minimum( $\alpha, \beta$ ), MinimumAverage( $\alpha$ )X 0.5
- Smoothing:** + $\alpha$  7, Savitzky-Golay mean, RD 5.0, Interpolation, Full
- AbsCalc:** Ref, Trans, Schulz reflection method, Absorption coefficient 0.1 1/cm, Thickness 1 cm, 2Theta 0.0 deg, 1/Kt, Profile
- Defocus file Select Transmission defocus HKL+T:** Defocus(1) functions file, C:\CTR\TEST\RAPID2-007-100 μm-FT10sec#2018-10-03#random#defocus#DEFOCUS\_F.TXT, Make defocus function files by TXT2, Files, Normalization, TextDisp
- Defocus(3) function files folder(Calc unbackdefocus):** SmartLab-DSH2mm-Schulz, Limit Alfa Defocus value 0.40
- Defocus(2) function files folder(Calc backdefocus):** SmartLab-DSH2mm-Schulz, Search minimum Equal Angle Rp%(Cubic only), 1/Ra, Profile
- Smoothing for ADC:** Cycles 3, Weight 6, Disp, After connection
- Normalization:** CTR, Connect, Average
- CenterData:** Average
- OutFiles:** Asc, MTextAsc, Ras, TXT, TXT2 (selected)

Buttons: Cancel, Calc, Connect, Exit&ODF, ODF, ValueODFVF..., ValueODFVF-A

The profile of  $\{0,0,0\}$  isn't found.



# Sample処理(RDの確認)

The screenshot displays the ODF software interface. At the top, four windows show RD contour plots for different samples:  $\{0,0,0\}$  128.29,  $\{0,0,0\}$  43.2,  $\{0,0,0\}$  38.1, and  $\{0,0,0\}$  19.3. The main window, titled "ODFPoleFigure2 3.82SKT[19/03/31] by CTR", contains a "Files select" section with "ASC(RAPID)" chosen. The "Calculation Condition" section includes "Background delete mode" (DoubleMode, SingleMode, Minimum( $\alpha$ ,  $\beta$ )), "Peak slit" (10.0 mm), "BG Slit" (10.0), "AbsCalc" (Ref, Trans, Schulz reflect), "Defocus file" (Defocus(1) functions file), "Smoothing for ADC" (Cycles: 3, Weight: 6), and "After connection" (checkbox). A central plot window, "MultiDisp Ver.1.107S", shows a profile plot with the title "alfa:65.0deg. Interporation RD=5.0deg. Max=0.22deg." The y-axis is "cps" (0.00 to 0.40) and the x-axis is "beta" (0 to 375). Two curves are shown: "raw" (red) and "rddata" (blue). The right panel includes "Smoothing" (Savitzky-Golay mean), "RD" (5.0, Interporation), "2Theta" (0.0 deg), "1/Ra" (radio button), and buttons for "Cancel", "Calc", "Connect", "Exit&ODF", "ODF", "ValueODFVF...", and "ValueODFVF-A". A blue arrow points from the "RD" section to the "Interporation" checkbox. A status bar at the bottom left reads "The profile of {0,0,0} isn't found."

# Sample処理(random補正量の指定)

The screenshot displays the ODFPoleFigure2 3.82SKT[19/03/31] by CTR software interface. At the top, four pole figures are shown for different samples, each with a title indicating the  $\{0,0,0\}$  peak intensity: 128.29, 43.2, 38.1, and 19.3. The pole figures are plotted on RD (Rolling Direction) and TD (Transverse Direction) axes. Below the pole figures is the main software window with a menu bar (File, Linear(absolute)Contour, Toolkit, Help, InitSet, BGMode, Measure, Condition Free, OverlapRevision, MinimumMode, Rp%, Normalization) and a file list containing ASC(RAPID) and several ASC files.

The 'Calculation Condition' panel is visible, showing various settings for background deletion, peak slit (10.0), and defocus file selection. A 'MultiDisp Ver.1.1075' window is overlaid, displaying a plot titled 'Defocus(1,1)'. The plot shows the intensity in counts per second (cps) versus the defocus angle  $\alpha$  (alfa) in degrees. A red curve represents the 111 reflection, and a blue horizontal line represents the LEVEL. The intensity of the 111 reflection decreases as the defocus angle increases from 40 to 85 degrees.

At the bottom left, a message states: 'The profile of {0,0,0} isn't found.'

alfa (deg)	Intensity (cps)
40	6.5
45	3.5
50	2.5
55	2.2
60	2.0
65	1.8
70	1.6
75	1.4
80	1.2
85	1.1

# Sample処理

The screenshot displays the ODFPoleFigure2 software interface. At the top, four windows show RD plots for different samples:  $\{0,0,0\}$  128.29,  $\{0,0,0\}$  43.2,  $\{0,0,0\}$  38.1, and  $\{0,0,0\}$  19.3. The main window is titled "ODFPoleFigure2 3.82SKT[19/03/31] by CTR". The interface includes a menu bar (File, Linear, Contour, Toolkit, Help, InitSet, BGMode, Measure, Condition, Free, OverlapRevision, MinimumMode, Rp%, Normalization), a file selection area, and a calculation condition panel. The calculation condition panel shows the current sample path:  $C:\%CTR\%TEST\%RAPID2-007-100\ \mu m-FT10sec\%2018-10-03\%sample\%A\%sample111-5degZcut.asc$ . The background delete mode is set to "Nothing", and the BG defocus is "SmartLab-DSH2mm-Schulz". The peak slit is 10.0 mm, and the BG slit is 10.0 mm. The peak slit / BGS... BG Scope is 75.0 deg. The smoothing is set to "Savitzky-Golay mean" with a radius of 7. The RD smoothing is set to "Interpolation" with a radius of 5.0. The main window also shows four RD plots for different samples:  $\{3,1,1\}$  9.94,  $\{2,0,0\}$  6.11,  $\{2,2,0\}$  6.38, and  $\{3,1,1\}$  2.86. The control panel on the right includes buttons for "TextDisp", "Profile", "Calc", and "Connect". The "Calc" and "ODF" buttons are circled in red. The "ODF" button is highlighted in blue. The "After connection" checkbox is checked. The status bar at the bottom left shows "Filemake success !!".

ODF向けファイル作成

# ODFファイル作成

PFtoODF3 8.35SKT[19/03/31] by CTR

File Option Symmetric Software Data Help

Lattice constant

Material Aluminum.txt

Structure Code(Symmetries after Schoenfiles) 7 - O (cubic)

a 1.0 <=b 1.0 <=c 1.0 alpha 90.0 beta 90.0 gamma 90.0

Initialize

Start

getHKL-Filename

AllFileSelect

PF Data

SelectFile(TXT(b,intens),TXT2(a,b,intens))	h,k,l	2Theta	Alpha scope	AlphaS	AlphaE	Select
Alsample111-5degZcut_chR0D1L39S_2.TXT	1,1,1	0.0	5.0->40.0	5.0	40.0	<input checked="" type="checkbox"/>
Alsample200-5degZcut_chR0D1L39S_2.TXT	2,0,0	0.0	0.0->50.0	0.0	50.0	<input checked="" type="checkbox"/>
Alsample220-5degZcut_chR0D1L39S_2.TXT	2,2,0	0.0	10.0->60.0	10.0	60.0	<input checked="" type="checkbox"/>
Alsample311-5degZcut_chR0D1L39S_2.TXT	3,1,1	0.0	20.0->60.0	20.0	60.0	<input checked="" type="checkbox"/>
	2,1,1	0.0		0.0	0.0	<input type="checkbox"/>
	3,1,1	0.0		0.0	0.0	<input type="checkbox"/>
	4,0,0	0.0		0.0	0.0	<input type="checkbox"/>
	3,3,1	0.0		0.0	0.0	<input type="checkbox"/>
	4,2,2	0.0		0.0	0.0	<input type="checkbox"/>
	5,1,1	0.0		0.0	0.0	<input type="checkbox"/>
	5,2,1	0.0		0.0	0.0	<input type="checkbox"/>
	5,3,1	0.0		0.0	0.0	<input type="checkbox"/>

Comment Alsample111-5degZcut\_chR0D1L39S\_2.TXT Alsample200-5degZcut\_chR0D1L39S\_2.TXT Alsample220-5degZcut\_chR0D1L39S\_2.TXT

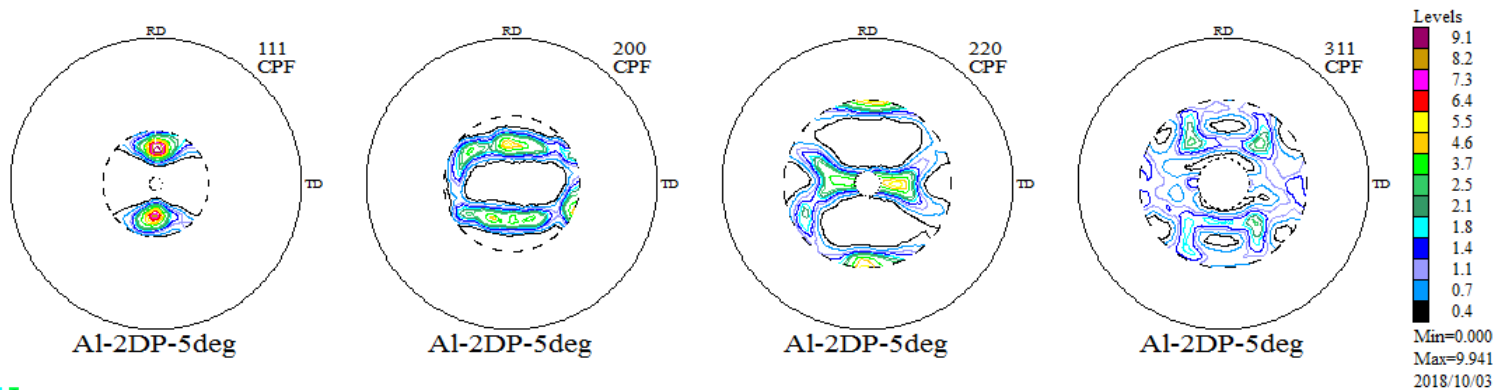
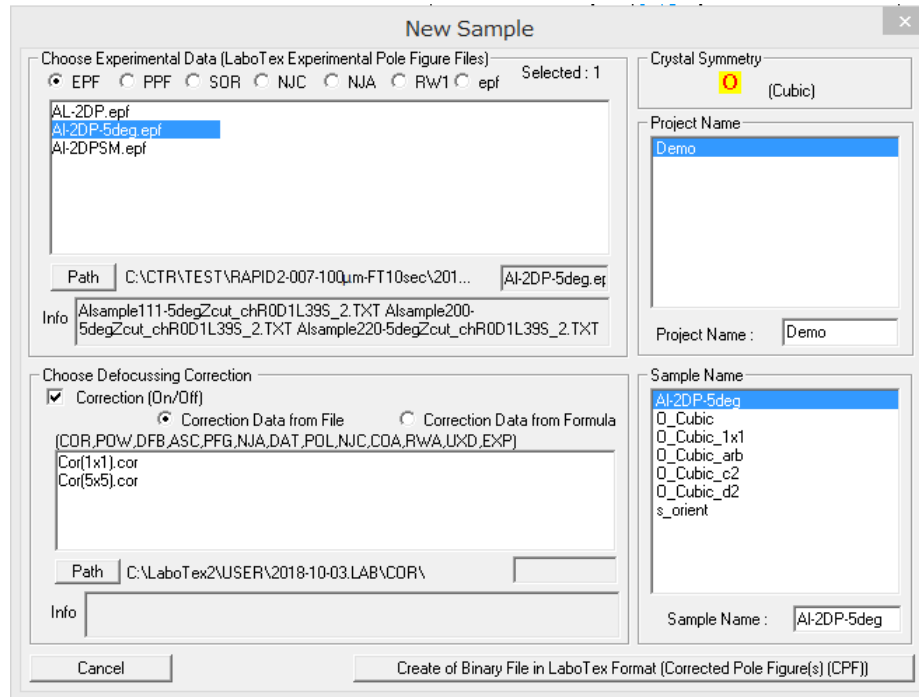
Symmetric type Full

CenterData  Average

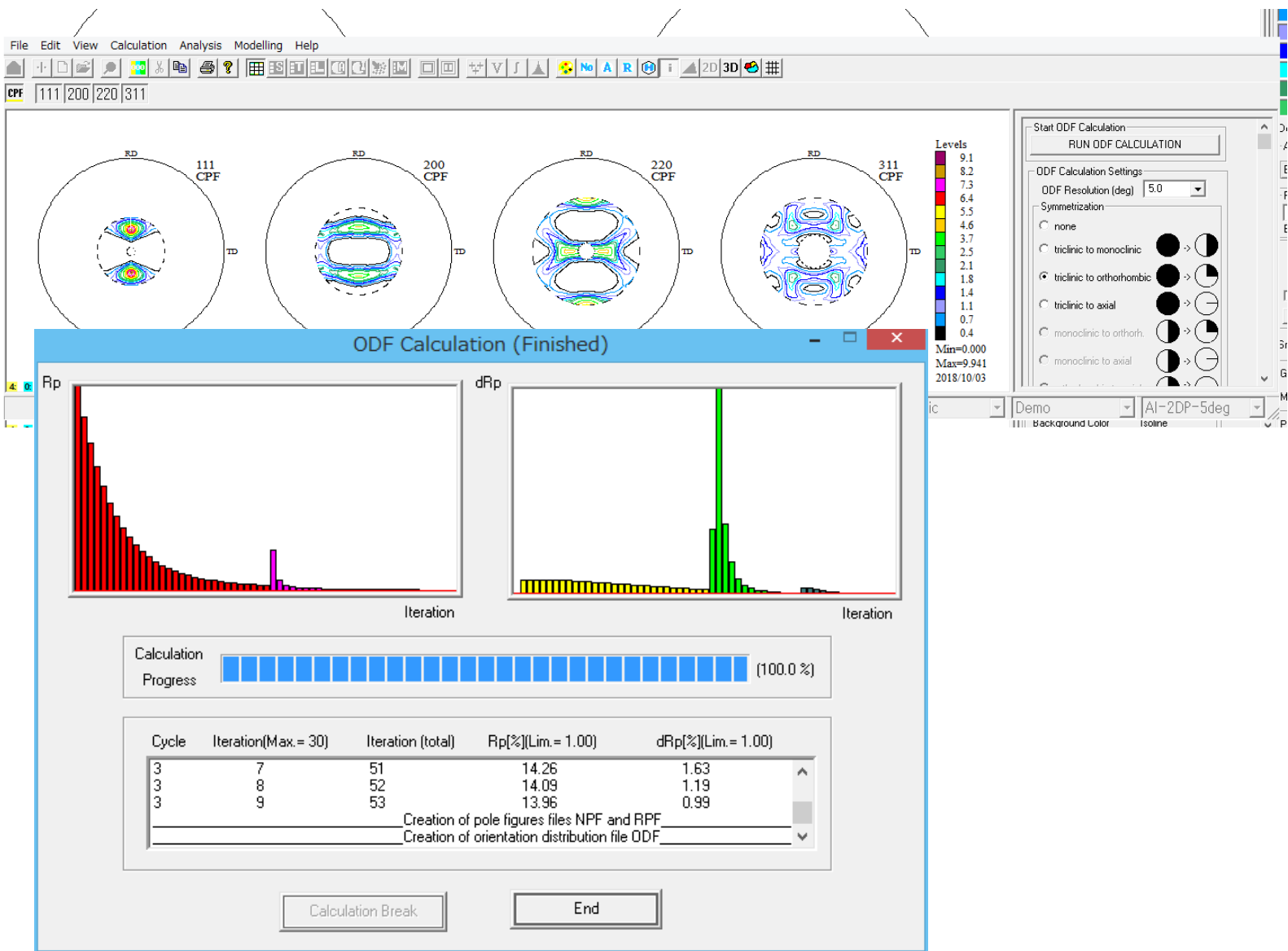
Epf file save

Labotex(EPF),popLA(RAW) filename AI-2DP-5deg

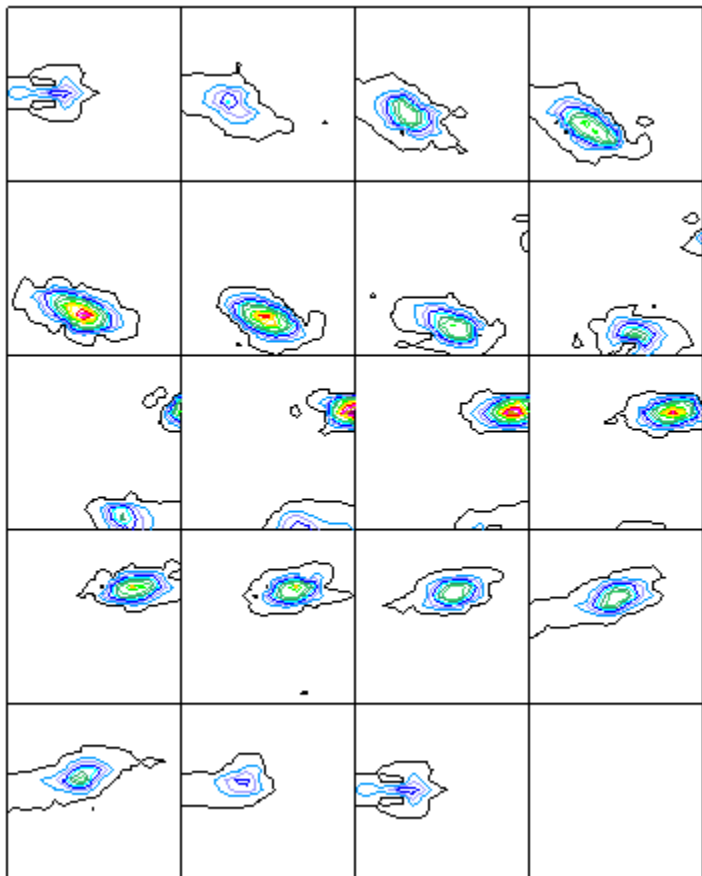
# LaboTexで読み込み



# ODF計算

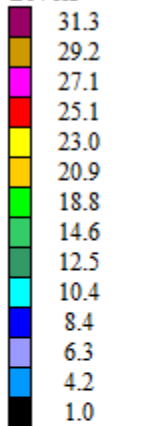


# ODF計算結果



Al-2DP-5deg

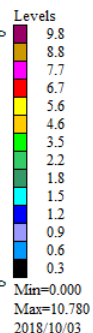
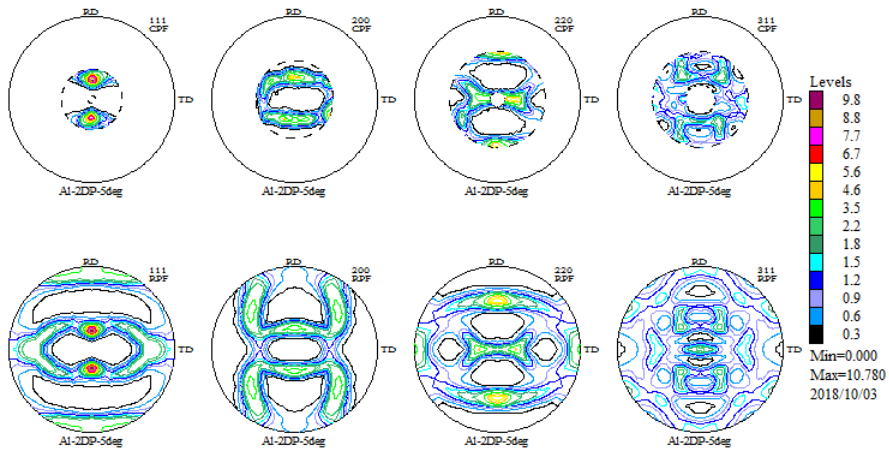
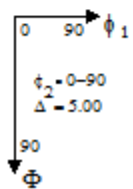
Levels



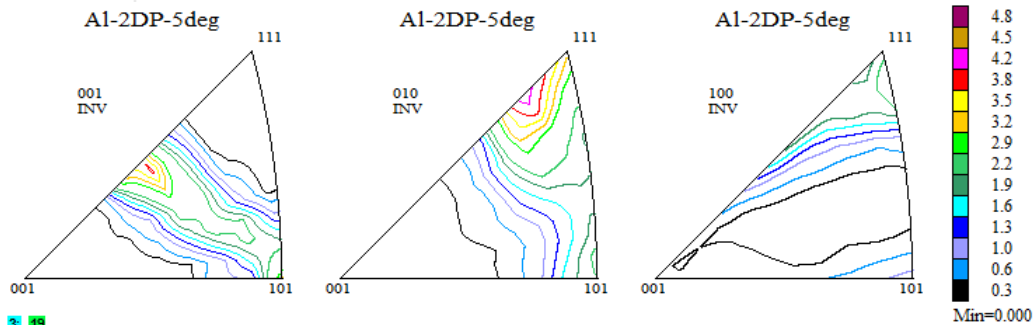
Max=33.402

Min=0.000

2018/10/03

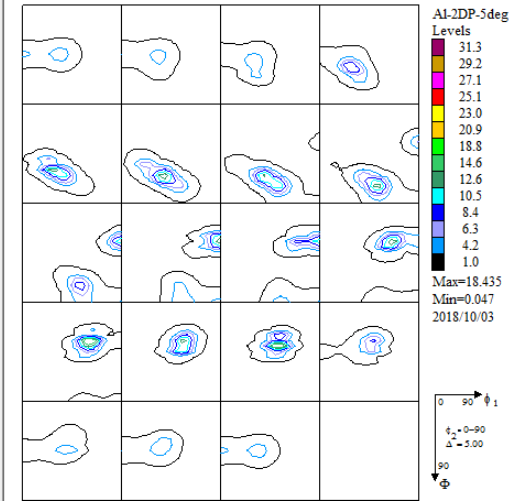
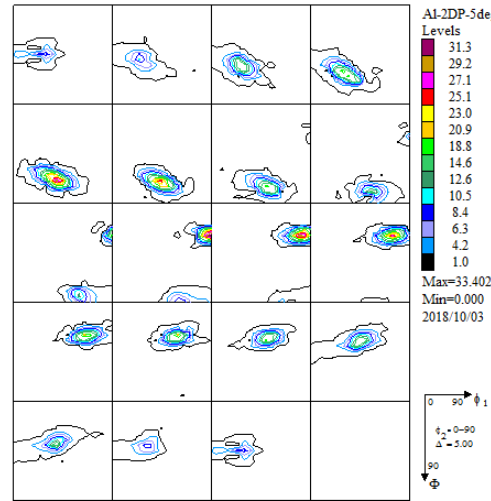
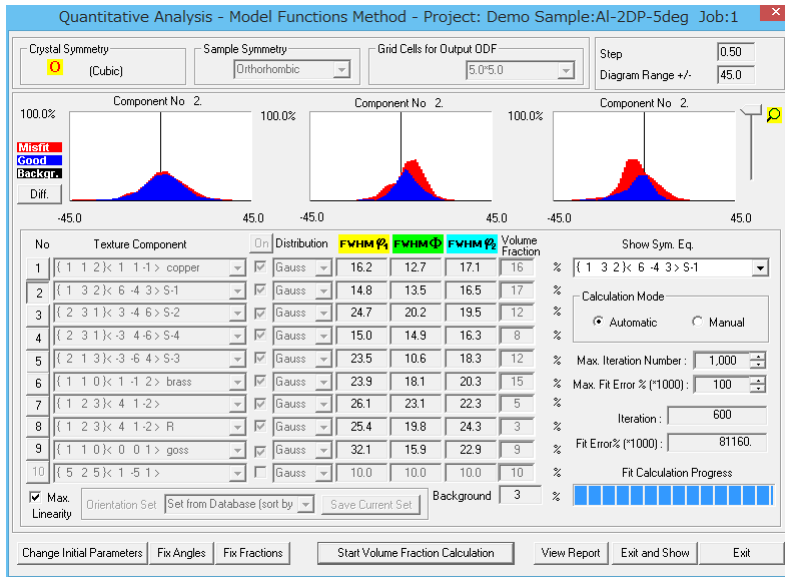


Min=0.000  
Max=10.780  
2018/10/03



Min=0.000

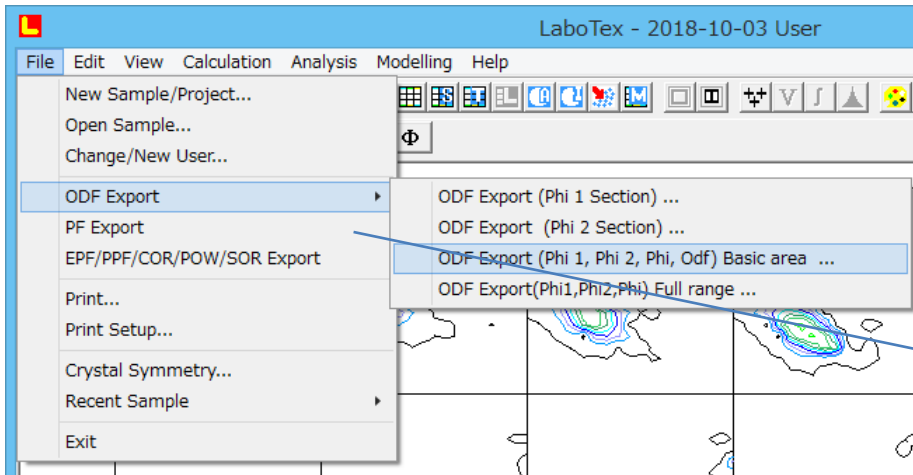
# 結晶方位の定量



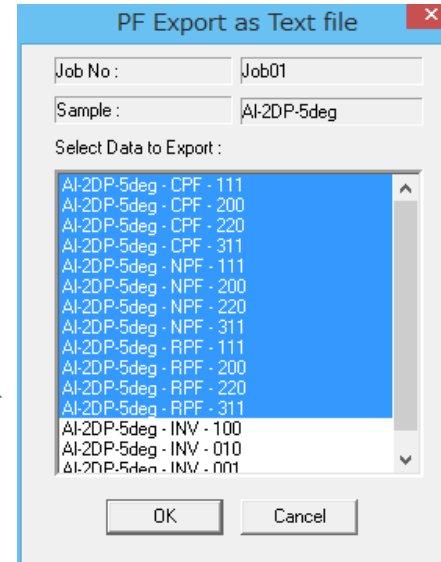
入力極点図から計算

VolumeFractionから計算

## ODFのExport



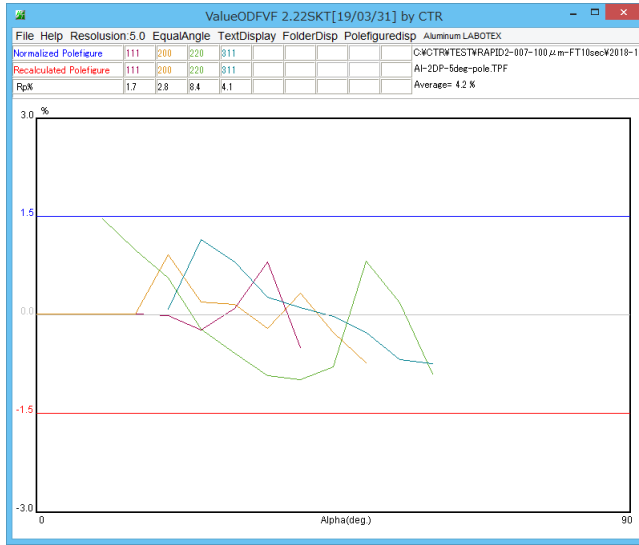
## 極点図のExport





# CTRソフトウェア

Error評価

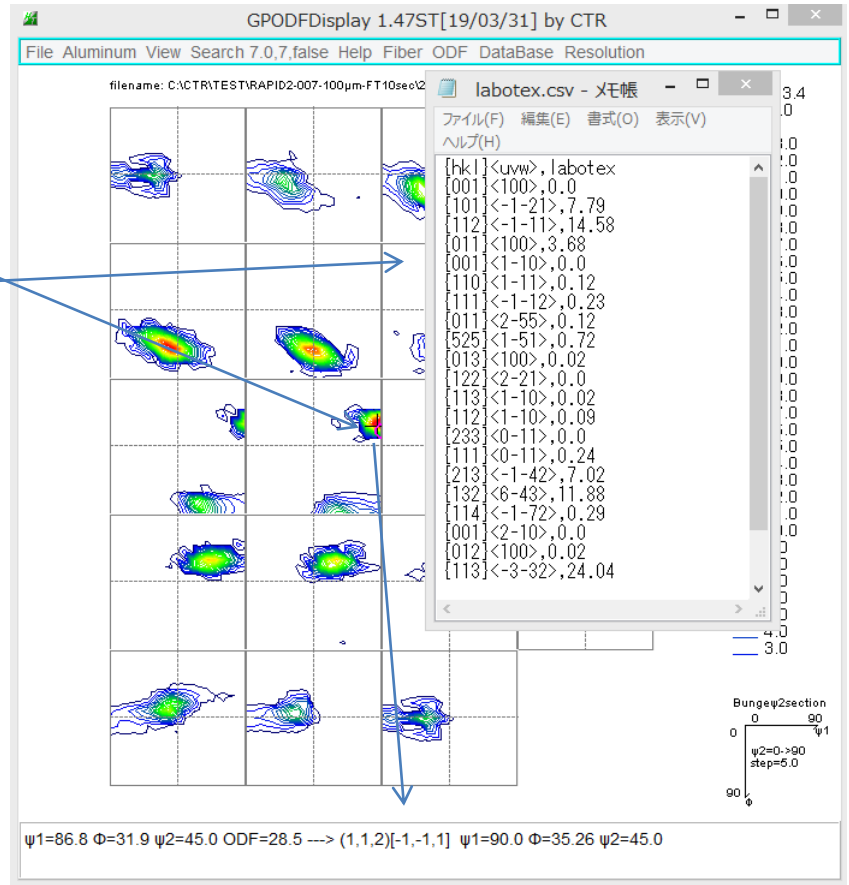


Normalized Polefigure	111	200	220	311
Recalculated Polefigure	111	200	220	311
Rp%	1.7	2.8	8.4	4.1

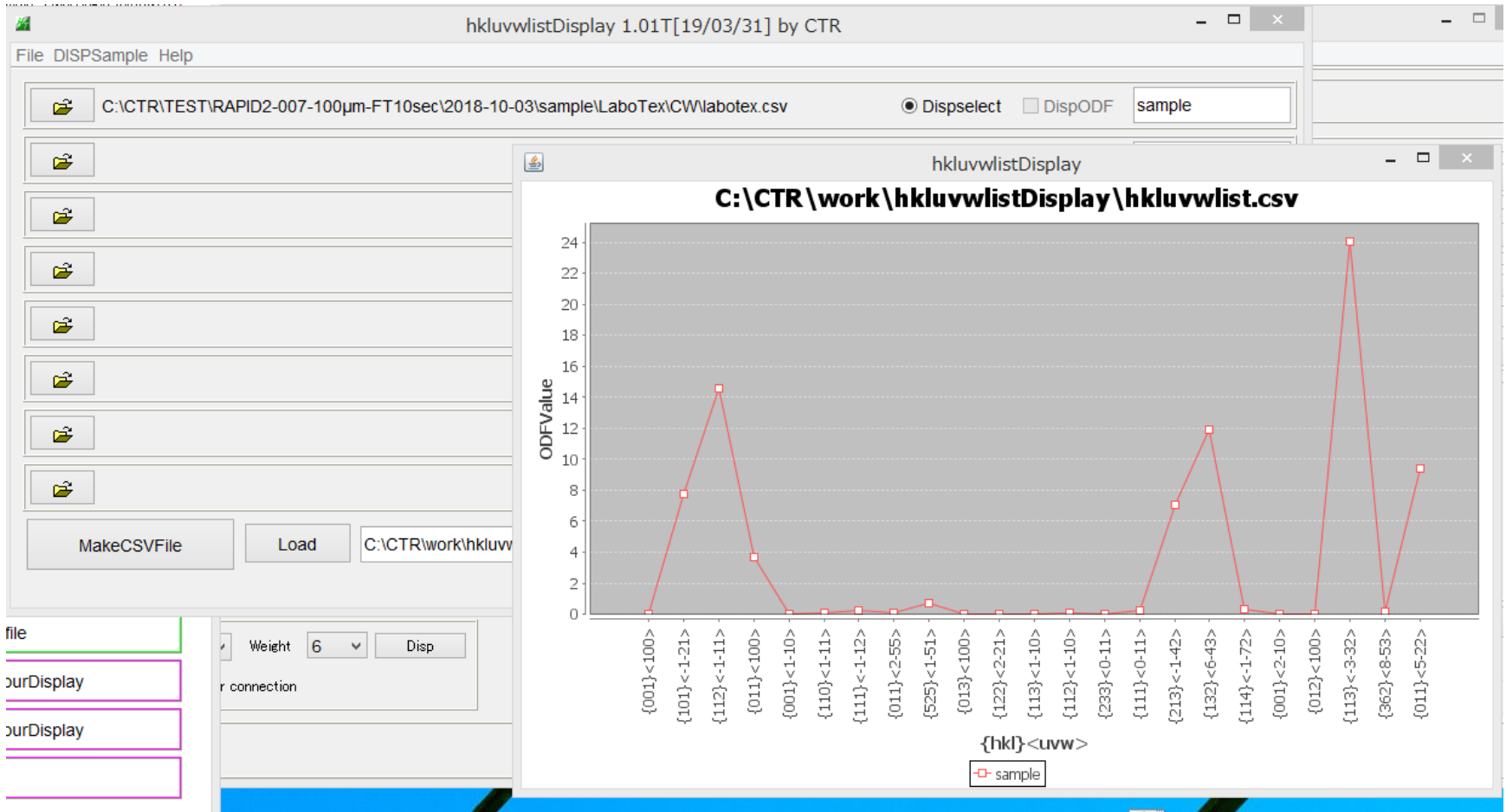
Al-2DP-5deg-pole.TPF  
Average= 4.2 %

マウスカーソル位置の方位計算

指定された方位の密度計算

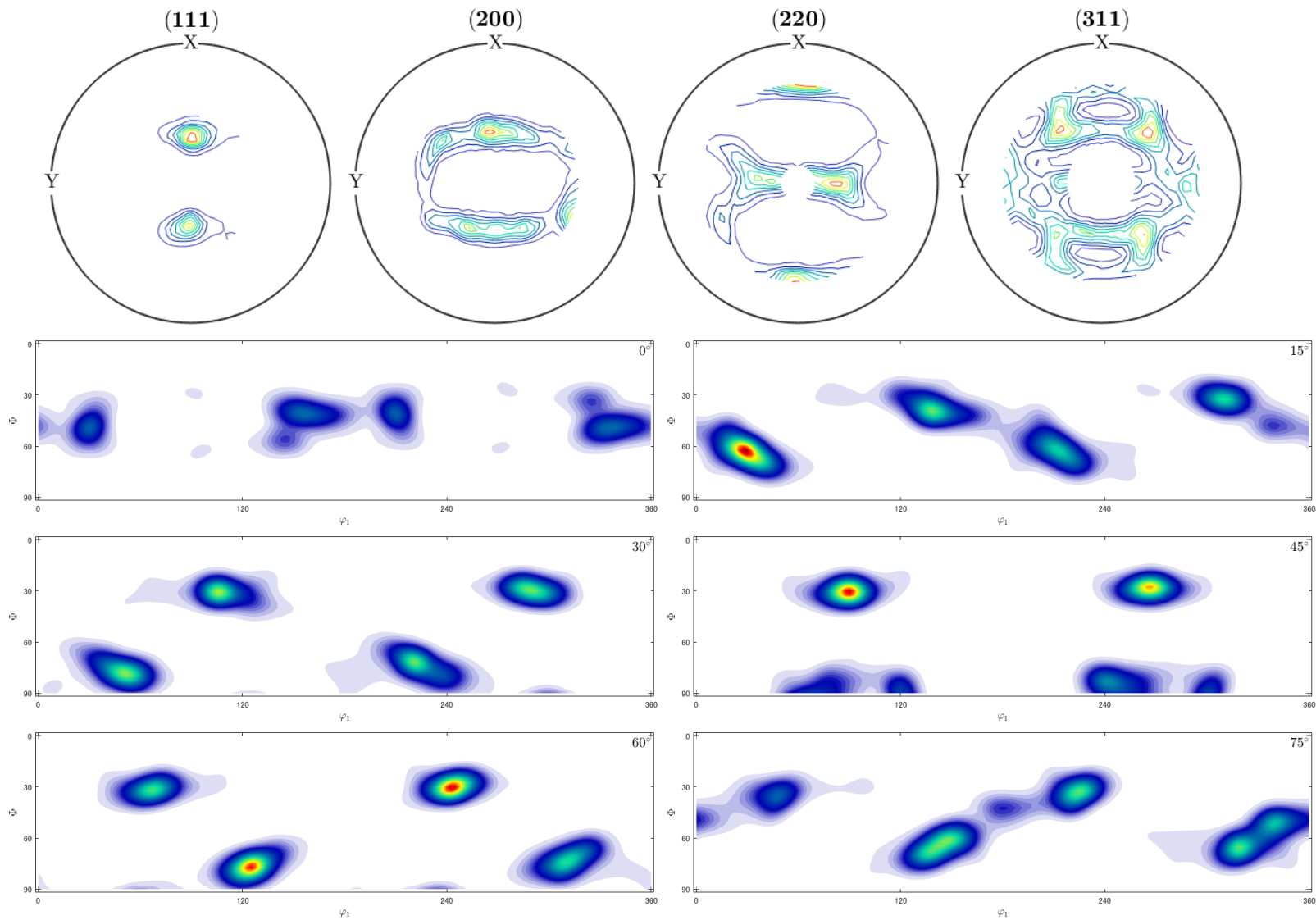


# 方位密度表現

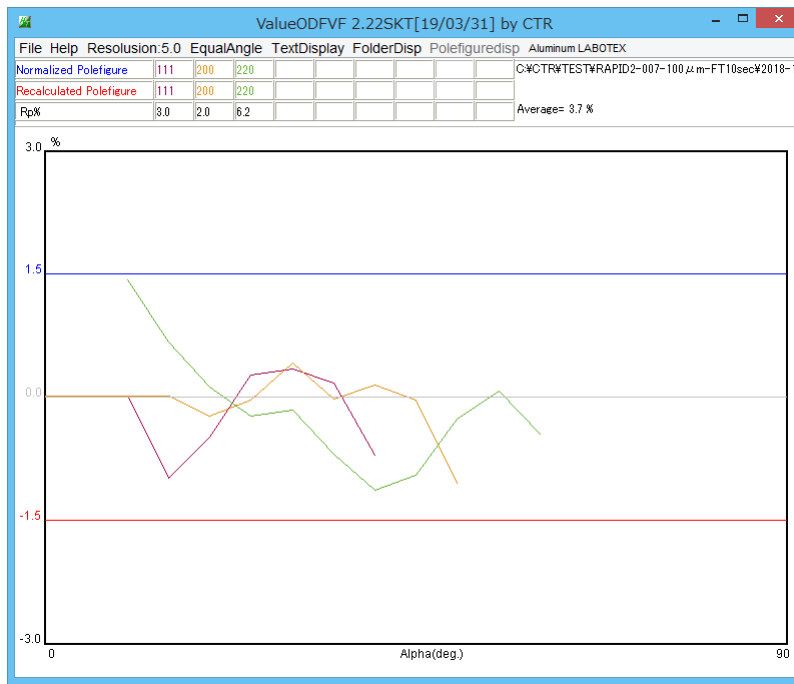
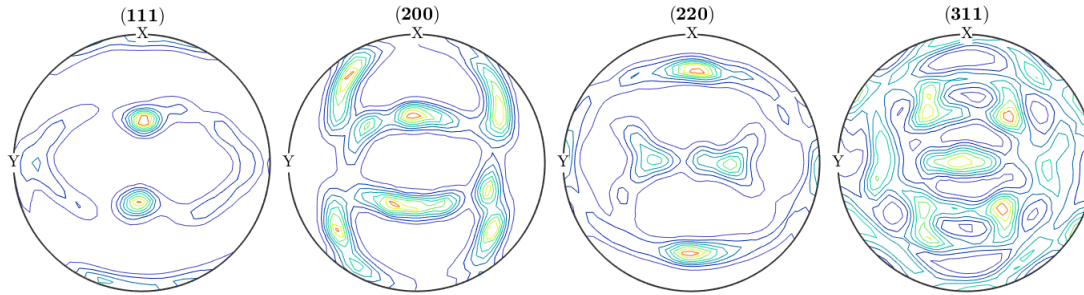


最大8個の方位密度比較が可能

# MTEX处理



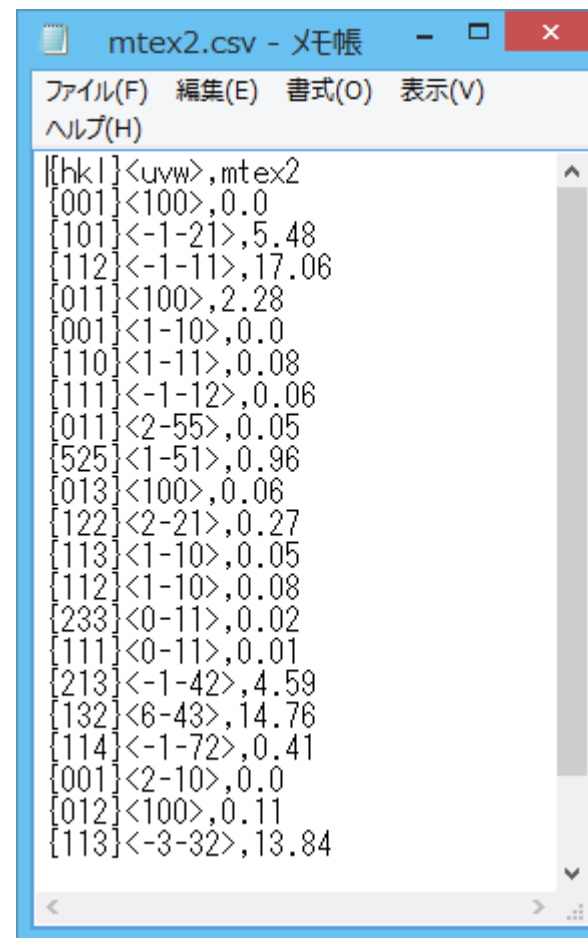
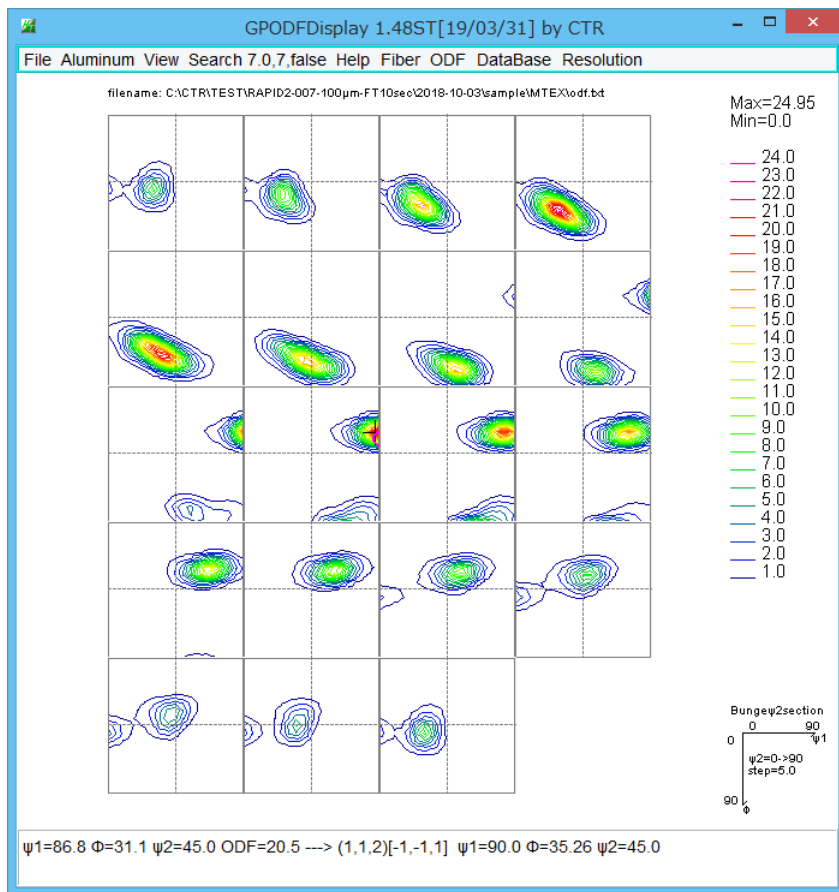
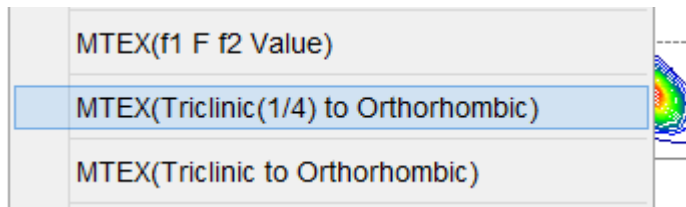
# MTEX処理(再計算極点図とError)



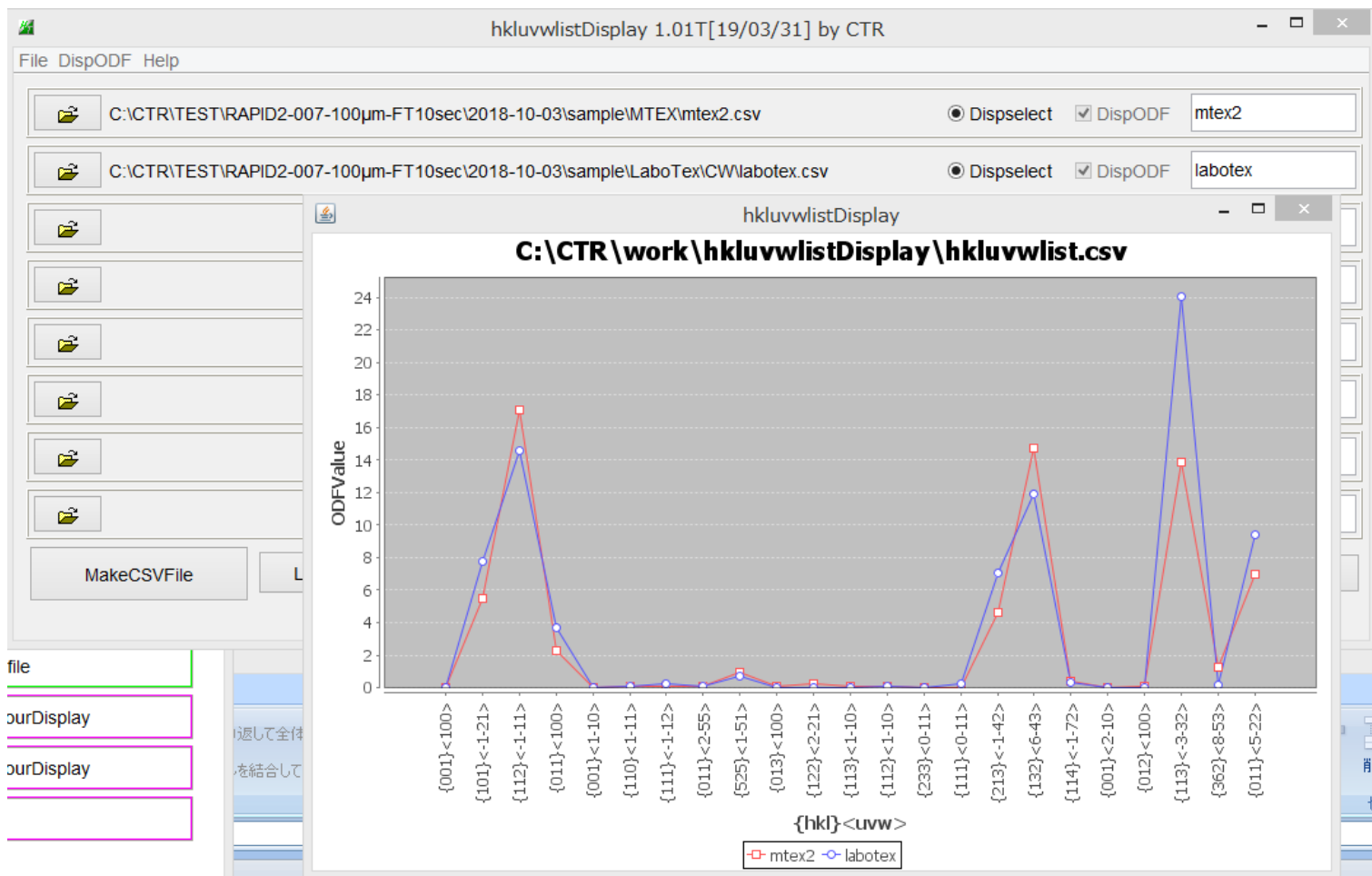
Normalized Polefigure	111	200	220
Recalculated Polefigure	111	200	220
Rp%	3.0	2.0	6.2

Average= 3.7 %

# ExportODFをOrthorhombicで表示と方位密度



# LaboTex-MTEX方位密度比較



方位密度はほぼ同一の結果が得られます。

# 同一反射の複数の極点図の場合

The screenshot displays the ODFPoleFigure2 software interface. The top row shows seven pole figure plots for reflections  $\{1,1,1\}$  and  $\{2,0,0\}$ . The central window is the main control panel, titled "ODFPoleFigure2 3.82SKT[19/03/31] by CTR". It includes a "Files select" section with a list of data files, a "Calculation Condition" section with various parameters like "Peak slit" and "BG Slit", and a "Smoothing" section. The bottom row shows three more pole figure plots for reflections  $\{1,1,1\}$ ,  $\{1,0,0\}$ , and  $\{1,1,0\}$ . A control panel on the right side of the main window has a "Connect" button circled in red. The background shows a Windows desktop with icons for "3D Explorer" and "ODFPoleFigur... - ショートカット".

データの接続が可能になりました。