Message ID: **175** Entry time: **Mon May 15 10:54:51 2023**

Experiment Date:	2023 05 15
Duration (Days):	5
User:	Stjepko Fazinic, Iva Bozicevic Mihalic, Anja Miokovic, Marija Tkalcevic
Accelerator:	Van de Graaff
Beam Line:	Old uProbe
Project:	Hi-REXS (HRZZ projekt)
Experiment Title:	HR PIXE of light metals with protons, supported by: Hi-REXS and RADIATE (TA proposal I. Campbell)
Beam:	3MeV H, 2.5MeV H, 2MeV H
Method:	HR PIXE

Beam deflection was connected to the horizontal deflector with -700 V. Vertical deflection is also connected since we use VDG.

GreatControl: X Binning = OFF, Y Binning = OFF, Readout Speed = 500 kHz, Gain = Max Sensitivity, Correct Bias = UNCHECKED, T_{ccd}= -70 ºC, T_{back}= 23 ºC, Chiller at 18 ºC

Chamber positioned according to the black marks on the floor that were drawn in February.

We are using SDD just to check purity of targets.

15.5.2023.

Beam: 3 MeV H^+ VDG

Focus (triplet): Me 20.3 A, Ox 43.1 A

Diffraction crystal: ADP(101) at 6.55 cm, peeking for 3 mm out of holder

Current on metal before measurement ~1.75 nA

Samples: Ti (position 1), Al foil folded many times(position 2), Mg (position 3), quartz (position 4), Si (position 5)

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2305434	Mg	1	10	MgKa line visible at ch~240
2305435	Mg	1	1	current reduced to ~1 nA
2305436	DARK	10	1	
2305437	Mg	900	1	I~0.6-0.8 nA
2305438	Mg	450	1	
2305439	Mg	350	1	I~1 nA (Andro's slits opened a bit)
2305440	Mg	900	1	- || -
2305441	Mg	200	1	
2305442	Mg	200	1	

Energy window used for Matlab analysis = [250,400]

In SDD spectrum we see only Mg peak.

Beam: 2.5 MeV H^+ VDG

Focus (triplet): Me 18.0 A, Ox 39.2 A

Current on metal before measurement ~0.8 nA

Samples and diffraction crystal unchanged.

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2305443	Mg	1	1	I~1 nA, Andro's slits opened a bit
2305444	Mg	900	1	
2305445	Mg	900	1	
2305446	Mg	900	1	
2305447	Mg	300	1	

16.5.2023.

Beam: 3 MeV H^+ VDG

Focus (triplet): Me 20.5 A, Ox 42.9 A

Diffraction crystal: ADP(101) at 10.3 cm, peeking for 3 mm out of holder

Current on metal before measurement ~1.8 nA

Samples are the same as yesterday: Ti (position 1), Al foil folded many times(position 2), Mg (position 3), quartz (position 4), Si (position 5)

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2305448	Al	1	1	too many events so we closed Andro's slits a bit -> I~1 nA
2305449	Al	1	1	line AlKa12 visible at ch~350
2305450	Al	1	1	line AlKa12 visible at ch~230 as we want it
2305451	DARK			
2305452	Al	600	1	I~0.9 nA
2305453	Al	900	1	
2305454	Al	600	1	I dropped to ~0.4 nA so it was increased from control room
2305455	Al	600	1	I~0.85 nA
2305456	Al	300	1	

Energy window used for Matlab analysis = [300,450]

In SDD spectrum apart from Al peak we see Fe peaks, and low Ti and Ga peaks.
-> Spector file 2305455 saved
-> SDD rate ~ 12-13 kHz

Beam: 2.5 MeV H^+ VDG

Focus (triplet): Me 18.3 A, Ox 38.8 A

Current on metal before measurement ~0.8 nA

Samples and diffraction crystal unchanged.

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2305457	Al	600	1	I~0.85-1 nA

2305458	Al	600	1	
2305459	Al	600	1	I~1-1.2 nA -> a bit too high -> we closed Andro's slits a bit
2305460	Al	300	1	I~0.8-0.9 nA

17.5.2023.

Beam: 3 MeV H^+ VDG

Focus (triplet): Me 20.9 A, Ox 42.8 A

Diffraction crystal: PET(002) at 9.9 cm, peeking for 3 mm out of holder, with blue dot facing the main door

Current on metal before measurement ~1.2-1.5 nA

Samples are the same as yesterday: Ti (position 1), Al foil folded many times(position 2), Mg (position 3), quartz (position 4), Si (position 5)

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2305461	Si	1	1	SiKa12 line visible in Vista on ch~250
2305462	Si	1	1	I~0.8 nA, too many events in one frame -> Andro's slits closed a bit
2305463	Si	1	1	I~0.2-0.15 nA
2305464	DARK	10	1	
2305465	Si	600	1	current fell during measurement -> Andro's slits opened a bit
2305466	Si	600	1	I~0.15-0.2 nA
We want to try to fasten up readout of CCD frame. **Readout speed set to 1MHz**.				
2305467	DARK	10	1	
2305468	Si	200?	1	We cannot get good frame from Matlab analysis.
Setting readout speed back to 500 kHz.				
2305469	Si	900	1	I~0.15-0.2 nA
2305470	Si	900	1	- || -

Energy window used for Matlab analysis = [420,520]

Beam: 2.5 MeV H^+ VDG

Focus (triplet): Me 19.0 A, Ox 39.2 A

Samples and diffraction crystal unchanged.

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2305471	Si	1	1	I~0.2 nA
2305472	Si	600	1	- || -, when I drops we open Andro's slits a bit vertically
2305473	Si	600	1	- || -
2305474	Si	600	1	- || -
2305475	Si	566	1	- || -

Beam: 2 MeV H^+ VDG

Focus (triplet): Me 16.2 A, Ox 34.9 A

Samples and diffraction crystal unchanged.

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2305476	Si	1	1	I~0.3-0.35 nA, SiKa12 line in Vista on ch~250
2305477	Si	600	1	- || -; frames 195-215 could have too many events!
2305478	Si	600	1	I~0.3-0.35 nA
2305479	Si	600	1	- || -
2305480	Si	566	1	- || -

18.5.2023.

Beam: 3 MeV H^+ VDG

Focus (triplet): Me 21 A, Ox 43 A

Diffraction crystal: Ge(220) at 9.3 cm, peeking for 3 mm out of holder, with blue dot facing the main door

Current on metal before measurement ~1.3 nA

New sample holder (with one bigger hole) put inside chamber.
Samples: Ti (position 3), CaF_2 (position 4)

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2305481	CaF_2	1	10	I~1.2-1.3 nA
2305482	CaF_2	1	1	- || -
In CCD frame we have a lot of gamma signals coming from F. We will measure some other Ca compound tomorrow and now we are moving to Ti. Ge(002) at 11.2 cm.				
2305483	Ti	1	10	- || -, TiKa12 line at ch~190
2305484	Ti	1	1	I~0.8-0.85 nA, TiKa12 line at ch~1220
2305485	DARK	10	1	
2305486	Ti	600	1	
2305487	Ti	600	1	
2305488	Ti	900	1	
2305489	Ti	900	1	

Energy window used for Matlab analysis = [1100,1400]

In SDD spectrum we see only Ti peaks and very small Al peak probably coming from the chamber.
-> Spector file 2305486 saved
-> SDD rate ~ 12-13 kHz

Beam: 2.5 MeV H^+ VDG

Focus (triplet): Me 18.6 A, Ox 38.8 A

Samples and diffraction crystal unchanged.

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2305490	Ti	1	1	I~0.8-0.85 nA
2305491	Ti	900	1	- || -

2305492	Ti	900	1	- || -
2305493	Ti	900	1	- || -
2305494	Ti	300	1	- || -

Beam: 2 MeV H^+ VDG

Focus (triplet): Me 16.2 A, Ox 34.4 A

Samples and diffraction crystal unchanged.

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2305495	Ti	1	1	I~1 nA
2305496	Ti	900	1	I~1.2 nA
2305497	Ti	900	1	- || -
2305498	Ti	900	1	- || -
2305499	Ti	600?	1	- || -, the beam got lost after frame ~380
2305500	Ti	600	1	- || -

19.5.2023.

Beam: 3 MeV H^+ VDG

Focus (triplet): Me 20.7 A, Ox 43.4 A

Diffraction crystal: Ge(220) at 9.3 cm, peeking for 3 mm out of holder, with blue dot facing the main door

Current on metal before measurement ~2.5 nA

Samples: Ti (position 3), CaO (position 4)

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2305501	CaO	1	1	I~0.8 nA, CaKa12 line on ch~250
2305502	DARK	10	1	
2305503	CaO	600	1	- || -
2305504	CaO	600	1	- || -
2305505	CaO	600	1	- || -
2305506	CaO	900	1	- || -
2305507	CaO	500	1	- || -

Energy window used for Matlab analysis = [850,1100]

Beam: 2.5 MeV H^+ VDG

Focus (triplet): Me 18.6 A, Ox 39.3 A

Samples and diffraction crystal unchanged.

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2305508	CaO	468?	1	I~1-1.1 nA, we lost the beam after frame ~300?
2305509	CaO	900	1	
2305510	CaO	900	1	

2305511	CaO	400	1	

Beam: 2 MeV H^+ VDG

Focus (triplet): Me 16.7 A, Ox 35.0 A

Samples and diffraction crystal unchanged.

FILE	SAMPLE	N_{frames}	t_{exp}/s	COMMENT
2305512	CaO	900	1	I~1-1.1 nA, we lost the beam after frame ~300?
2305513	CaO	900	1	
2305514	CaO	900	1	
2305515	CaO	400	1	
2305516	CaO	400	1	