

**[Fri, Dec 08, 2017, 09:56:24 ]**

umbau West-1 auf TRIUMF Messungen Leiter Transmission

Setup now on West-1

with small cascade counter " Charlie "

30cm coated Plexiglas guide directly behind the prestorage vessel

Proton beam current = 1400  $\mu$ A

small cascade threshold = 110

High Voltage set to 1400 V

**[Fri, Dec 08, 2017, 12:00:50 ]**

3.tof pulse geht in zentral klappe geschlossen

west-1 und west-2 synchronous after tof.3

**[Fri, Dec 08, 2017, 12:01:40 ]**

open VAT W-1 for direct transmission

vacuum in prestorage vessel =  $1 \times 10^{-4}$  mbar

## **NORMALIZATION**

**[Fri, Dec 08, 2017, 12:05:17 ]** Start with direct shots

4.tof  $\sim$  6'800'000 UCN

setup prestorage vessel

filling time 8.6 s

storage time variable

measurement time 100s

5s storage measurement

6.tof = 129'000 counts

**[Fri, Dec 08, 2017, 12:16:50 ]** storage time = 100s

7.tof = ( 6332 - 900 ) counts

8.tof

9.tof

**[Fri, Dec 08, 2017, 12:30:45 ]** 20s storage time

10.tof ~ 69'000 counts

11.tof

**[Fri, Dec 08, 2017, 12:45:41 ]** 5s storage time

12.tof

**[Fri, Dec 08, 2017, 12:47:17 ]** 5 s storage time

13.tof

**[Fri, Dec 08, 2017, 12:52:10 ]** 100 s storage time

14.tof

we opened the shutter early so the spectrum has starting at ch ~ 1800 UCN from the source  
needs to be cut for analysis

**[Fri, Dec 08, 2017, 12:58:28 ]** direct shot - no storage - no shutters closed

**[Fri, Dec 08, 2017, 14:29:49 ]**

change setup to guide 1

However this was the wrong normalization

we have to mount 2 times 30cm Plexi tubes to be able to mount the test guides with extra flanges  
therefore we mount the correct normalization setup

VAT - 30cm guide + 30 cm guide + Cascade counter

**[Fri, Dec 08, 2017, 16:24:30 ]**

pumping is good

**[Fri, Dec 08, 2017, 16:26:58 ]**

direct shot

16.tof = 6'400'000

**[Fri, Dec 08, 2017, 16:34:01 ]** set to 5s storage time

17.tof = 117463

18.tof didnt work because labview was off... Lets consider it is a leak check measurement with shutter 2 closed all the time...

19.tof = 117797

20.tof = 117300

**[Fri, Dec 08, 2017, 16:51:55 ]** set to 20s storage time

21.tof = 62344

## **NORMALIZATION correct**

**[Fri, Dec 08, 2017, 16:56:30 ]**

open guide and beam shutter on South beamline

therefore the correct measurements start here:

**[Fri, Dec 08, 2017, 16:57:05 ]** storage time 20s

tof.22 = 56458

tof.23 = 55976

tof.24 = 56127

**[Fri, Dec 08, 2017, 17:12:22 ]** storage time 100 s

tof.25 = 5066

tof.26 = 5109

tof.27 = 5012

tof.28 = 5168

tof.29 = 5235

tof.30 = 5151

tof.31 = 5206

**[Fri, Dec 08, 2017, 17:47:29 ]** storage 5 s

tof.32 = 106079

tof.33 = 105637

tof.34 = 106371

tof 35 = 105561 (configuration change, background included)

**[Fri, Dec 08, 2017, 18:13:48 ]** the proton current dropped to 0 for 2 cycles. After it was back, we noticed it wasn't sync to the countdown on the screen anymore... We have to be careful.

**[Fri, Dec 08, 2017, 18:38:11 ]** mounting the first guide (Japanese SS with NiP coating).

**[Fri, Dec 08, 2017, 19:08:42 ]** open shutter 1, in order to get 1 measurement with no storage.

tof.48 = 2872300

**[Fri, Dec 08, 2017, 19:18:59 ]** storage 100 s

tof.50 = 3309

going to have diner now...

tof.60 = 3406

**[Fri, Dec 08, 2017, 20:15:26 ]** storage 5 s

tof.61 = 74493

tof.62 = 73988

tof.63 = 74710

**[Fri, Dec 08, 2017, 20:28:19 ]** storage 20 s

tof.64 = 39917

tof.65 = 40292

tof.66 = 39984 (configuration change, background included)

**[Fri, Dec 08, 2017, 21:10:33 ]** remove the first guide (Japanese SS with NiP coating).

**[Fri, Dec 08, 2017, 21:29:09 ]** open shutter 1, in order to get 1 measurement with no storage.

tof.76 = 4811900

**[Fri, Dec 08, 2017, 21:37:03 ]** storage 5 s

tof.77 = 104842

tof.78 = 104963

tof.79 = 104891

**[Fri, Dec 08, 2017, 21:48:22 ]** storage 20 s

tof.80 = 55638

tof.81 = 55881

tof.82 = 55524

**[Fri, Dec 08, 2017, 22:03:30 ]** storage 100 s

tof.83 = 5047

tof.84 = 4971

tof.85 = 5141

tof.86 = 5066

tof.86 = 5012

tof.87 = 5091

tof.88 to be checked in the data (remove noise at the end)

**[Fri, Dec 08, 2017, 23:18:57 ]** mounting the second guide (Japanese Ti with NiP coating).

**[Fri, Dec 08, 2017, 23:20:41 ]** open shutter 1, in order to get 1 measurement with no storage.

tof.98 = 1614500

**[Fri, Dec 08, 2017, 23:28:22 ]** storage 100 s

tof.99 = 2435 (background 314)

**[Fri, Dec 08, 2017, 23:33:42 ]** leaving, getting stat over night.

tof.90 (091217) = 2571 <- last measurement before the beam stops, at around 7:30 AM.

**[Sat, Dec 09, 2017, 08:00:43 ]** storage 20 s when the beam restarts (seems not before 9:30 according to the PSI cyclotron webpage)...

**[Sat, Dec 09, 2017, 11:49:43 ]** beam went back at around 11:30, but the first run with UCN produced is tof.99 (started at 11:50).

tof.99 = 27200

tof.100 =

tof.101 = 27237

**[Sat, Dec 09, 2017, 12:02:56 ]** storage 5 s

tof.102 = 48830

tof.110 = 48266

**[Sat, Dec 09, 2017, 12:51:18 ]** stop turbo, ramp down HV, prepare for normalization measurement.

**[Sat, Dec 09, 2017, 13:33:19 ]** open shutter 1, in order to get 1 measurement with no storage.

tof.120 = 4330000

**[Sat, Dec 09, 2017, 13:38:58 ]** storage 5 s

tof.121 = 94702

tof.122 = 94674

tof.123 = 94643

**[Sat, Dec 09, 2017, 13:51:55 ]** storage 20 s

tof.124 = 50908

tof.125 = 51080

**[Sat, Dec 09, 2017, 14:05:10 ]** cyclotron out... Cyclotron status webpage says 1 hour maintenance.

**[Sat, Dec 09, 2017, 17:36:52 ]** restarted. run 126 is not relevant cause not stable.

tof.127 = 51154 consistent with before.

**[Sat, Dec 09, 2017, 17:40:22 ]** storage 100 s

tof.128 = 4766

.....

tof.135 = 4867

**[Sat, Dec 09, 2017, 18:21:15 ]** prepare to break vacuum, in order to install SS disk.

**[Sat, Dec 09, 2017, 19:07:26 ]** disk installed, ready to get measurement in direct. Open shutter 1, in order to get 1 measurement with no storage.

tof.145 = 2761911

**[Sat, Dec 09, 2017, 19:13:23 ]** storage 100 s

tof.146 = 3836

tof.147 = 3747

tof.148 = 3800

tof.149 = 3837

tof.150 = 3791

tof.151 = 3737

tof.152 = 3798

tof.153 = 3860

**[Sat, Dec 09, 2017, 19:51:08 ]** storage 20 s

tof.154 = 38772

tof.155 = 38669

tof.156 = 38810

**[Sat, Dec 09, 2017, 20:05:40 ]** storage 5 s

tof.157 = 70610

tof.158 = 71058

tof.159 = 70822

**[Sat, Dec 09, 2017, 20:23:47 ]** prepare to break vacuum in order to install the two flanges (normally connected to TRIUMF guides) in order to perform a normalization measurement.

**[Sat, Dec 09, 2017, 21:19:39 ]** two flanges installed (tapped and clamped...), ready to get measurement in direct. Open shutter 1, in order to get 1 measurement with no storage.

**[Sat, Dec 09, 2017, 21:23:39 ]** beam stopped. Pretty annoying... Close shutter 1 for the moment, in order to avoid possible vacuum problem.

**[Sat, Dec 09, 2017, 21:58:48 ]** seems the cyclotron can deliver a stable beam again. Open shutter 1, in order to get 1 measurement with no storage.

tof.175 = 3218500

**[Sat, Dec 09, 2017, 22:02:52 ]** storage 100 s

tof.176 = 4042

tof.177 = 4098

tof.178 = 3957

tof.179 = 4101

tof.180 = 4103

tof.181 = 4120

tof.182 = 4074

tof.183 = 4137

**[Sat, Dec 09, 2017, 22:41:17 ]** storage 20 s

tof.184 = 42501

tof.185 = 42306

tof.186 = 42544

**[Sat, Dec 09, 2017, 22:55:28 ]** storage 5 s

tof.187 = 77710

tof.188 = 77900

tof.189 = 77755

**[Sat, Dec 09, 2017, 23:11:38 ]** break the vacuum in order to install UGC01.

**[Sat, Dec 09, 2017, 23:50:59 ]** UGD01 installed, ready to get measurement in direct. Open shutter 1, in order to get 1 measurement with no storage.

tof.198 = 2942550

**[Sat, Dec 09, 2017, 23:58:17 ]** storage 100 s

tof.199 = 3487

..... over night

tof.107 (101217) = 3365

**[Sun, Dec 10, 2017, 08:57:29 ]** storage 20 s

tof.108 = 36907

tof.109 = 37298

tof.110 = 37136

**[Sun, Dec 10, 2017, 09:11:19 ]** storage 5 s

tof.111 = 67774

tof.112 = 67410

tof.113 = 67947

**[Sun, Dec 10, 2017, 09:27:14 ]** prepare to break vacuum in order to install the two flanges (normally connected to TRIUMF guides) in order to perform a normalization measurement.

**[Sun, Dec 10, 2017, 10:09:01 ]** two flanges installed (tapped and clamped...), ready to get measurement in direct. Open shutter 1, in order to get 1 measurement with no storage.

tof.122 = 2871000

**[Sun, Dec 10, 2017, 10:14:23 ]** storage 100 s

tof.123 = 3763

tof.124 = 3695

tof.125 = 3808



tof.126 = 3856

tof.127 = 3696

tof.128 = 3652

tof.129 = 3750

tof.130 = 3790

**[Sun, Dec 10, 2017, 10:52:47 ]** storage 20 s

tof.131 = 38625

tof.132 = 38525

tof.133 = 38710

**[Sun, Dec 10, 2017, 11:06:21 ]** storage 5 s

tof.134 = 70218

tof.135 = 70471

tof.136 = 69393

**[Sun, Dec 10, 2017, 11:21:25 ]** break the vacuum in order to install UGC03.

**[Sun, Dec 10, 2017, 12:03:19 ]** UGD03 installed, ready to get measurement in direct. Open shutter 1, in order to get 1 measurement with no storage.

tof.145 = 2568457

**[Sun, Dec 10, 2017, 12:09:26 ]** storage 100 s

tof.146 = 3122

lunch break

tof.155 = 3218

**[Sun, Dec 10, 2017, 12:58:10 ]** storage 20 s

tof.156 = 35516

tof.157 = 35591

tof.158 = 35419

**[Sun, Dec 10, 2017, 13:11:58 ]** storage 5 s

tof.159 = 64555

tof.160 = 64542

tof.161 = 64873

**[Sun, Dec 10, 2017, 13:27:43 ]** prepare to break vacuum in order to install the two flanges (normally connected to TRIUMF guides) in order to perform a normalization measurement.

**[Sun, Dec 10, 2017, 14:04:37 ]** two flanges installed (tapped and clamped...), ready to get measurement in direct. Open shutter 1, in order to get 1 measurement with no storage.

Beam stopped.

Beam resumed.

tof.170 = 2817484

**[Sun, Dec 10, 2017, 14:14:20 ]** storage 100 s

tof.172 = 3783

tof.173 = 3694

tof.174 = 3709

tof.175 = 3654

tof.176 = 3764

tof.177 = 3696

tof.178 = 3797

tof.179 = 3680

**[Sun, Dec 10, 2017, 14:57:56 ]** storage 20 s

tof.180 = 37699

tof.181 = 37487

tof.182 = 37091

**[Sun, Dec 10, 2017, 15:12:21 ]** storage 5 s

tof.183 = 68085

tof.184 = 68361

tof.185 = 68190

**[Sun, Dec 10, 2017, 15:27:29 ]** break the vacuum in order to install the third TRIUMF guide (ep with NiP coating).

**[Sun, Dec 10, 2017, 16:05:46 ]** third TRIUMF guide (ep with NiP coating) installed, ready to get measurement in direct. Open shutter 1, in order to get 1 measurement with no storage.

tof.193 = 2582200

tof.194 = 2646827

**[Sun, Dec 10, 2017, 16:14:57 ]** storage 100 s

tof.195 = 3089

**[Sun, Dec 10, 2017, 16:15:42 ]** storage 5 s

tof.196 = 64715

tof.197 = 64496

tof.198 = 64565

**[Sun, Dec 10, 2017, 16:33:31 ]** storage 20 s

tof.199 = 35192

tof.200 = 35127

tof.201 = 35127

**[Sun, Dec 10, 2017, 16:47:10 ]** storage 100 s

tof.202 = 3210

break, data being taken...

tof.226 = 3150

more break...

**[Sun, Dec 10, 2017, 20:21:04 ]** back, but beam stopped 15 minutes ago...

**[Sun, Dec 10, 2017, 20:21:23 ]** just came back...

tof.241 = 3140

**[Sun, Dec 10, 2017, 20:22:16 ]** prepare to break vacuum in order to install the two flanges (normally connected to TRIUMF guides) in order to perform a normalization measurement.

**[Sun, Dec 10, 2017, 21:01:07 ]** two flanges installed (tapped and clamped...), ready to get measurement in direct. Open shutter 1, in order to get 1 measurement with no storage.

tof.249 = 2593800

**[Sun, Dec 10, 2017, 21:06:57 ]** storage 5 s

tof.250 = 63325

tof.251 = 63750

tof.252 = 63714

**[Sun, Dec 10, 2017, 21:18:14 ]** storage 20 s

tof.253 = 34441

tof.254 = 34784

tof.255 = 34679

**[Sun, Dec 10, 2017, 21:33:37 ]** storage 100 s

tof.256 = 3500

... cleaning the area ...

tof.260 = 3518

... more cleaning ...

tof.265 = 3555

**[Sun, Dec 10, 2017, 22:30:50 ]** prepare to break vacuum in order to perform more normalization measurements (we connect both plexi guides together, as at the beginning).

**[Sun, Dec 10, 2017, 23:01:23 ]** ready to get measurement in direct. Open shutter 1, in order to get 1 measurement with no storage.

tof.273 = 3181818

tof.274 = 3244000

**[Sun, Dec 10, 2017, 23:11:16 ]** start a set of storage 20 s measurement over night in order to check the reproducibility of the measurements.

tof.275 = 39139

**[Sun, Dec 10, 2017, 23:14:12 ]** keep taking data overnight with this setup.

**[Mon, Dec 11, 2017, 13:07:58 ]** check some data in order to estimate any possible decrease of the UCN yield over time.

tof.278 (10/12/2017 at 23:31) = 39217 $\pm$ 198

tof.7 (11/12/2017 at 00:31) = 39137 $\pm$ 198

tof.19 (11/12/2017 at 01:36) = 39201 $\pm$ 198

5 sigma jump here.

tof.31 (11/12/2017 at 02:36) = 38273 $\pm$ 196

tof.43 (11/12/2017 at 03:36) = 38611 $\pm$ 196

tof.57 (11/12/2017 at 04:47) = 38310 $\pm$ 196

tof.69 (11/12/2017 at 05:47) = 38274 $\pm$ 196

tof.81 (11/12/2017 at 06:47) = 38093 $\pm$ 195

4 sigma jump here.

tof.93 (11/12/2017 at 07:47) = 37285+/-193

**[Mon, Dec 11, 2017, 16:41:49 ]**

no conditioning today but

halted proton beam because of works in area South

start kicking again with

8s pulses - 300s period 1400 muA proton beam current

next file = 95.tof - no good kick

**[Mon, Dec 11, 2017, 16:53:32 ]**

tof.98 looks OK : 32618 <- still tuning?

tof.99 = 39741

tof.100 = 40230

tof.101-102-103 <- no beam coming...

tof.104 = 39710

tof.105 = 39358

tof.106 = 39679

seems stable, will let it run..

tof.148 = 39000

tof.149 = 38968

...

tof.174 = 39001

**[Tue, Dec 12, 2017, 09:07:01 ]** end of experiment.