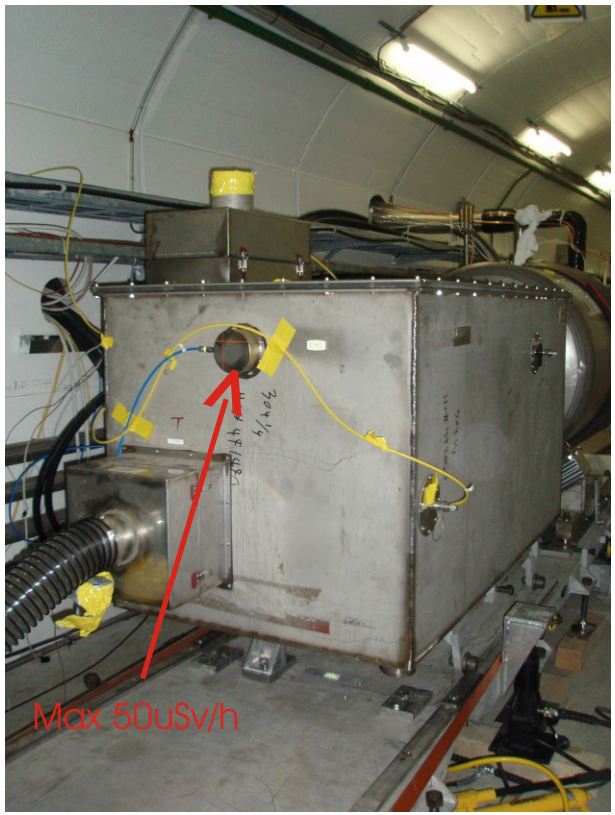
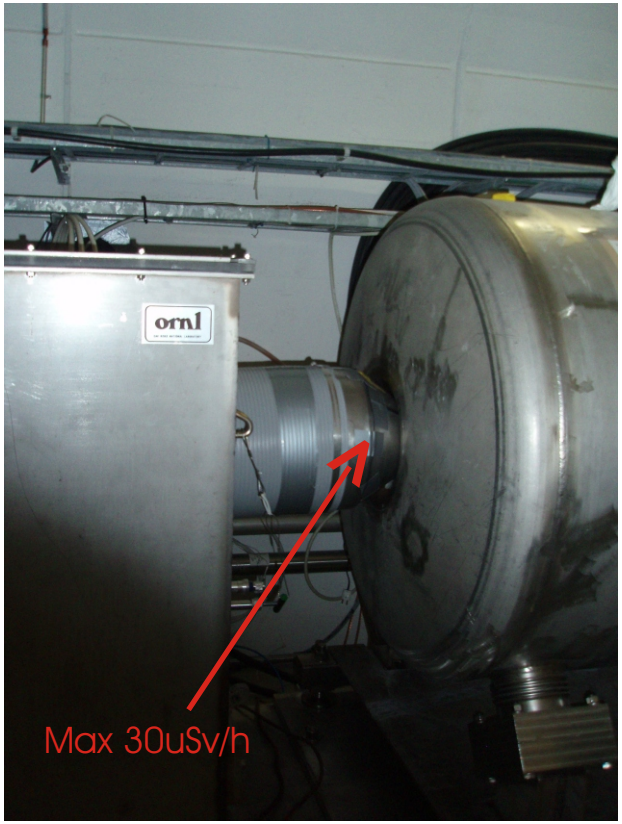
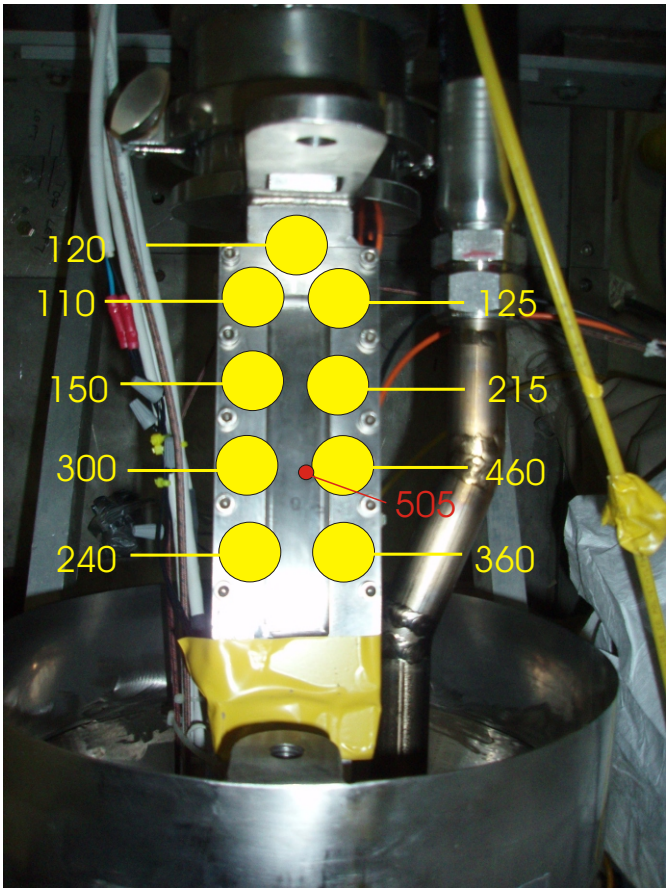
Doserates measured on the MERIT experiment : 04/02/2008





1 uSv/h contact doserate around the container and the solenoid

MERIT window measurement



Measurement point in counts per second
measured with an AD17 proportional counter

Hot spot

G A M M A S P E C T R O M E T R Y - R A D I O P R O T E C T I O N

---------- Gamma analysis ----------

****
** **
** ----> Merit 001 - Hg **
** **
****

Report Generated On : 2/7/08 2:06:36 PM
Sample Description 1 : Mercure de l'exp. MERIT
Sample Description 2 : Controle avant rejet
Demandeur: : P. Carbonez
Sample Title : Ge4_N-TOF
File Name : Z:\Ge4_M_TOF\TOF48001.CNF
Sample Type : TOF
Sample Geometry : Cyl@2cm
Detector Name : GE4

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 80 - 8192
Peak Area Range (in channels) : 70 - 8192
Identification Energy Tolerance : 1.500 keV

Sample Taken On : 2/6/08 8:00:00 AM

Sample Size : 1.170E+003 g

Acquisition Started : 2/6/08 8:32:59 AM

Live Time : 10000.0 seconds
Real Time : 10020.9 seconds

Energy Calib. Used Done On : 1/8/08
Efficiency Calib. Used Done On : 2/6/08
Background File : X:\BKGFILES\G00d04b.cnf

==========
== La decision de l'elimination du materiel ==
== (en tant que dechet conventionnel ou radioactif) ==
== appartient au donneur d'ordre ==
==========

Ce resultat d'analyse peut etre consulte sur le Web
http://cern.ch/spectro/root/data.htm

==========

== Analyse par : PV
== Vu et verifie par : YD

==========

==========COMMENTAIRES==========

Voir liste p4

********** Radioprotection Group **********
***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****
*****   *****
****

Sample Title: Ge4_N-TOF
Nuclide Library Used: N:\TOF48001.NLB

..... IDENTIFIED NUCLIDES .....

Nuclide	Halflife	Conf.	Energy (keV)	Yield (%)	Activity (Bq /g)	
Ag-105	4.13E+001 D	0.988	280.44*	30.20	5.9E+000 ± 21.1%	/
			306.25*	0.50	9.5E-001 ± 219.3%	
			319.16*	4.35	7.1E-001 ± 24.6%	
			331.51*	4.10	6.6E-001 ± 36.5%	=
			344.52*	41.40	6.7E-001 ± 15.4%	
			360.66	0.50		
			370.17*	0.73	4.8E-001 ± 83.2%	
			392.64*	1.98	7.9E-001 ± 29.4%	
			443.37*	10.50	6.3E-001 ± 21.3%	
			560.72*	0.58	7.4E-001 ± 46.6%	
			617.85*	1.16	6.1E-001 ± 36.3%	
			644.55*	11.10	5.8E-001 ± 20.1%	"
			650.72*	2.54	6.9E-001 ± 19.4%	
			673.21*	1.05	6.4E-001 ± 46.6%	
			743.31*	0.57	9.3E-001 ± 35.8%	#
			807.46*	1.16	6.4E-001 ± 29.9%	
			1087.94*	3.85	6.9E-001 ± 19.2%	
Ag-110m	2.50E+002 D	0.963	446.80	3.64		
			620.35	2.77		
			657.75*	94.40	4.8E-002 ± 15.6%	
			677.61*	10.68	4.2E-002 ± 46.2%	
			686.99*	6.47	4.5E-002 ± 48.8%	
			706.67*	16.68	4.5E-002 ± 26.2%	
			744.26*	4.64	1.1E-001 ± 32.3%	#
			763.93*	22.28	4.8E-002 ± 21.7%	
			818.02*	7.30	4.6E-002 ± 39.3%	
			884.67*	72.60	4.8E-002 ± 15.2%	
			937.48*	34.20	4.9E-002 ± 17.3%	x
			1384.27*	24.26	5.1E-002 ± 18.4%	
			1475.76*	3.97	6.2E-002 ± 26.9%	
			1505.00*	13.06	5.1E-002 ± 22.8%	
			1562.27	1.18		
Hg-194	4.44E+002 Y	0.594	65.12* @	23.10	3.0E+001 ± 23.4%	+
Au-194			66.83* @	39.60	2.8E+001 ± 22.8%	+
			75.70* @	17.30	1.9E+001 ± 22.7%	+
			293.58	10.40		
			328.50*	61.00	1.8E-002 ± 42.6%	
			364.87	1.51		
			482.80	1.13		
			528.76	1.65		
			622.05	1.71		

♀Interference Corr. Act. Report:Merit 001 - Hg 2/7/08 2:06:43 Page 3

Nuclide	Halflife	Conf.	Energy (keV)	Yield (%)	Activity (Bq /g)	

Hg-194	4.44E+002	Y	0.594	645.18*	2.14	3.0E+000 ±	23.4%	"
Au-194				938.71*	1.10	1.5E+000 ±	25.9%	x
				948.29	2.20			
				1104.06	2.01			
				1150.78	1.39			
				1175.34	2.01			
				1218.76	1.10			
				1342.15	1.22			
				1468.89*	6.40	2.0E-002 ±	39.4%	
				1592.40	1.10			
				1595.80	1.71			
				1885.90	1.89			
				1887.00	1.40			
				1924.18	2.01			
				2043.67*	3.60	1.3E-002 ±	88.9%	
Au-195	1.86E+002	D	0.988	30.88*	0.75	2.0E+008 ±	1180.%	-> X de Ag
				65.12* @	28.70	2.4E+001 ±	26.3%	+
				66.83* @	49.20	2.3E+001 ±	25.6%	+
				75.70* @	21.40	1.5E+001 ±	26.1%	+
				98.88*	10.90	2.6E+001 ±	26.6%	
				129.76	0.82			
Au-196	6.18E+000	D	0.866	333.03*	22.90	1.2E-001 ±	35.1%	=
				355.68*	87.00	9.3E-003 ±	25.8%	
				426.09	7.20			
Hg-203	4.66E+001	D	1.000	279.20*	81.46	1.6E+001 ±	15.2%	/

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.500 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000 sigma

********** Radioprotection Group **********
***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****
*****

	Nuclide		Halflife		Conf.	Weighted Mean Activity (Bq /g)		MDA
X	Cr-51		2.77E+001	D	0.948			
	Ag-105		4.13E+001	D	0.988	6.56E-001 ±	11.3%	1.3E-002
	Ag-110m		2.50E+002	D	0.963	4.86E-002 ±	11.7%	2.3E-003
X	Cs-128		2.43E+000	D	0.776			
X	Hf-175		7.00E+001	D	0.863			
X	Os-185		9.36E+001	D	0.605			
X	Au-193		1.77E+001	H	0.532			
	Hg-194	@	4.44E+002	Y	0.594	1.85E-002 ±	27.7%	6.8E-003
	Au-195	@	1.86E+002	D	0.988	2.56E+001 ±	26.6%	1.8E-001
	Au-196		6.18E+000	D	0.866	9.25E-003 ±	25.7%	4.3E-003
	Hg-203		4.66E+001	D	1.000	1.61E+001 ±	15.2%	0.0E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma

♀Interference Corr. Act. Report:Merit 001 - Hg 2/7/08 2:06:43 Page 5

********** U N I D E N T I F I E D P E A K S **********

Peak Locate Performed on: 2/6/08 3:31:43 PM
Peak Locate From Channel: 80
Peak Locate To Channel: 8192

	Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	
	1	27.30	1.9882E-001	13.54	-> X de Ag
m	5	68.85	1.4375E+000	2.60	-> X de Hg
m	6	70.78	3.0321E+000	2.00	-> X de Hg
m	7	72.84	7.3825E-001	3.19	-> X de Pb
m	9	77.88	7.6346E-001	3.18	-> X de Pb
m	10	80.09	1.1968E+000	2.61	-> X de Pb ou Hg
m	11	82.45	6.4677E-001	3.37	-> X de Hg
	24	511.92	3.0002E-002	25.58	-> annihil.
	26	609.44	5.0079E-003	114.82	-> BDF/Nat.
	46	1542.12	1.7491E-003	81.59	-> BDF/Nat.

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 2.000 sigma

♀Nuclide MDA Report:Merit 001 - Hg 2/7/08 2:06:53 Page 6

****
***** N U C L I D E M D A R E P O R T *****
****

File Name: Z:\Ge4_M_TOF\TOF48001.CNF
Detector Name: GE4
Sample Geometry: Cyl@2cm
Sample Title: Ge4_N-TOF
Nuclide Library Used: N:\TOF48001.NLB
MDA Confid. Factor: 5.00 %

Nuclide Name	Nuclide MDA (Bq /g)
Ar-42	5.80E-003
Sc-44	1.99E-003
Sc-46	1.68E-003
V-48	1.15E-003
Mn-54	1.90E-003
Co-56	1.97E-003
Co-57	1.43E-001
Co-58	2.91E-003
Co-60	1.24E-003
As-74	4.71E-003
Se-75	3.38E-002
Br-82	2.44E-003
Y-88	8.39E-004
Nb-95	3.32E-003
ZR-95	3.69E-003

	Rh-102	4.19E-003
+	Ag-105	1.31E-002
+	Ag-110m	2.32E-003
	Ag-111	2.58E-001
	Te-121	3.75E-003
	Te-121m	3.14E-002
	Sb-122	4.86E-003
	Te-123m	6.43E-002
	I-124	5.15E-003
	Sb-124	1.92E-003
	I-125	7.44E+002
	Sb-125	1.56E-002
	Sn-125	1.50E-002
	Xe-125	6.48E-002
	I-131	6.51E-003
	Cs-137	6.97E-003
	Hf-172	1.05E+000
	Lu-172	5.71E-003
	Ta-183	5.74E-002
+	Hg-194	6.79E-003
+	Au-195	1.84E-001
+	Au-196	4.28E-003
	Po-206	4.41E-003
>	Bi-207	1.97E-003

+ = Nuclide identified during the nuclide identification

---

* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

G A M M A S P E C T R O M E T R Y - R A D I O P R O T E C T I O N

---------- Gamma analysis ----------

****
**
** ----> MERIT001
**
****

Report Generated On : 12/21/07 3:56:54 PM
Sample Description 1 : Oil from the piston of the Hg loop
Sample Description 2 : MERIT experiment
Demandeur: : P. Carbonez
Sample Title : Ge4_N-TOF
File Name : Z:\Ge4_M_TOF\TOF47000.CNF
Sample Type : TOF
Sample Geometry : GE4-Cyl@2cm
Detector Name : GE4

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 40 - 8192
Peak Area Range (in channels) : 40 - 8192
Identification Energy Tolerance : 0.700 keV

Sample Taken On : 11/30/07 12:01:00 PM

Sample Size : 1.000E+002 g

Acquisition Started : 12/21/07 12:10:51 PM

Live Time : 10000.0 seconds
Real Time : 10001.4 seconds

Energy Calib. Used Done On : 11/19/07
Efficiency Calib. Used Done On : 12/21/07
Background File : X:\BKGFILES\G00d04b.cnf

==========
== La decision de l'elimination du materiel ==
== (en tant que dechet conventionnel ou radioactif) ==
== appartient au donneur d'ordre ==
==========

Ce resultat d'analyse peut etre consulte sur le Web
http://cern.ch/spectro/root/data.htm

==========

== Analyse par : Pieter Vanderniepen
== Vu et verifie par : YD

==========

==========COMMENTAIRES==========

Be-7 : 0,24 Bq/g (±16.6%)

********** Radioprotection Group **********
***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****
*****   *****
****

Sample Title: Ge4_N-TOF
Nuclide Library Used: X:\NCTCam\Activstd.NLB

..... IDENTIFIED NUCLIDES .....

Nuclide	Halflife	Conf.	Energy (keV)	Yield (%)	Activity (Bq /g)
Be-7	5.31E+001 D	0.998	477.59*	10.39	2.4E-001 ± 16.6%

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 0.700 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000 sigma

********** Radioprotection Group **********
***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****
*****   *****
****

Nuclide	Halflife	Conf.	Weighted Mean Activity (Bq /g)	MDA
Be-7	5.31E+001 D	0.998	2.35E-001 ± 16.6%	3.4E-002

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma

********** U N I D E N T I F I E D P E A K S **********

Peak Locate Performed on: 12/21/07 3:56:53 PM
Peak Locate From Channel: 40
Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty
1	295.10	7.3817E-003	64.12 -> BDF/Nat.
3	609.24	5.3508E-003	59.26 -> BDF/Nat.
4	1120.59	1.8789E-003	93.70 -> BDF/Nat.

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 2.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

File Name: Z:\Ge4_M_TOF\TOF47000.CNF
Detector Name: GE4
Sample Geometry: GE4-Cyl@2cm
Sample Title: Ge4_N-TOF
Nuclide Library Used: X:\NCTCam\Activstd.NLB
MDA Confid. Factor: 5.00 %

	Nuclide Name	Nuclide MDA (Bq /g)
+	Be-7	3.36E-002
	Na-22	2.97E-003
	Na-24	3.98E+007
@	Cl-38	3.70E+024
@	Cl-39	3.70E+024
	K-40	2.89E-002
@	Ar-41	3.70E+024
	K-42	2.88E+010
	K-43	1.85E+004
	Sc-44	3.22E-003
	Sc-44m	1.26E+000
	Ti-44	1.71E-003
	Sc-46	2.80E-003
	Ca-47	8.91E-002
	Sc-47	2.92E-001
	V-48	6.05E-003
	Cr-51	4.75E-002
	Mn-52	3.63E-002
	Mn-54	2.81E-003
	Co-55	1.87E+006
	Co-56	3.31E-003
@	Mn-56	3.70E+024
	Ni-56	2.84E-002
	Co-57	2.89E-003
	Co-58	3.10E-003
	Fe-59	6.65E-003
	Co-60	2.50E-003
	Cu-64	5.73E+011
@	Ni-65	3.70E+024
	Zn-65	8.31E-003
	Zn-69	3.05E+008
	Zn-72	5.82E+000
	Se-75	4.79E-003
	As-76	3.75E+003
	Br-77	4.33E+000
	Br-82	5.98E+001
	Rb-83	7.13E-003
	Sr-85	5.85E-003
@	Sr-85m	3.70E+024
@	Kr-88	3.70E+024
@	Rb-88	3.70E+024

Nuclide Name	Nuclide MDA (Bq /g)
@ Rb-88	3.70E+024
Y-88	2.85E-003
Zr-88	3.36E-003
Zr-89	2.79E-001
@ Mo-90	3.70E+024
Sr-91	4.99E+013
Nb-95	5.00E-003
Nb-95m	6.29E-001
Zr-95	6.11E-003
Tc-96	7.69E-002
Zr-97	2.51E+006
Mo-99	5.59E-001
@ Tc-99	3.70E+024
Ru-103	4.03E-003
Ag-105	4.32E-003
Rh-105	2.89E+002
Ag-106	2.05E-002
Ru-106	2.54E-002
Cd-109	2.48E-003
Ag-110	3.07E-003
Sn-113	2.72E-003
In-114	9.14E-003
Te-121	6.22E-003
Sb-122	6.59E-001
Te-123	3.41E-003
I-124	1.30E-001
Sb-124	3.51E-003
I-125	2.09E-003
Sb-125	3.08E-003
Xe-125	2.15E+006
I-126	1.67E-002
Sb-126	8.09E-003
Xe-127	4.52E-003
I-130	5.17E+009
Ba-131	7.68E-003
I-131	1.95E-002
Te-132	2.90E-001
Ba-133	1.78E-003
Cs-134	2.99E-003
Cs-136	7.97E-003
Cs-137	3.24E-003
Ce-139	2.71E-003
Ba-140	3.26E-002
La-140	2.06E+001
Ce-141	8.31E-003
Ce-144	2.26E-002
Eu-152	2.54E-003
Eu-154	5.68E-003
Hf-181	7.77E-003
Ta-182	3.72E-003

Nuclide Name	Nuclide MDA (Bq /g)
Ta-182	3.72E-003

Ir-192	3.91E-003
Au-194	4.08E+001
Au-198	5.96E-001
Tl-202	8.96E-003
Bi-207	2.22E-003
Th-232	6.88E-003
U-235	5.06E-003
U-238	3.36E-002
Am-241	4.16E-003

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction