



## Boulby Underground Germanium Suite

Boulby Mine  
Loftus  
Saltburn by the Sea  
Cleveland  
TS13 4UZ

### Assay report for sample BU1935\_PMMA

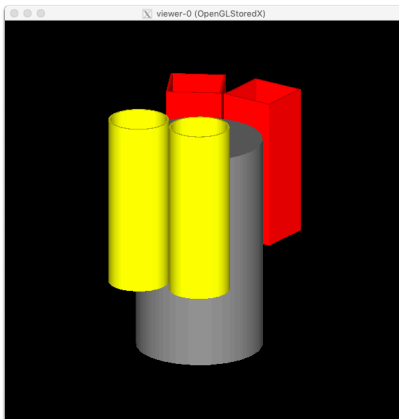
Authors: Paul Scovell, Emma Meehan

21<sup>st</sup> May 2019

Sender name	Ruben Saakyan
Institute of sender	UCL
Project	Unknown
Date received at Boulby	2019/03/13
Live time of assay	27.9 days
Sample info	213.4 grams, BU1935, 2 circular tubes, 2 square tubes
Status of sample	Stored underground

Detector	Belmont	Background file	Background_20190502, live time 14.5 days
Simulation Package	Geant 4 (Version 4.10.4.p03)	Specific activity (mBq/kg, mBq/# etc)	mBq/kg
Analysis version number	V1	Person performing Analysis	Paul Scovell

Simulation (Version 4.10.4.p03)



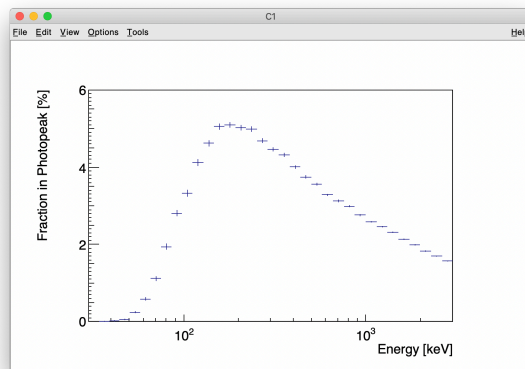
Sample on detector



Sample on scale (Mass includes mass of sample bags)



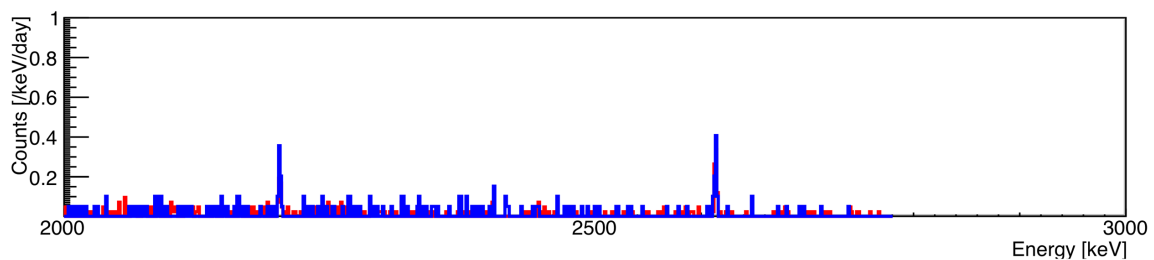
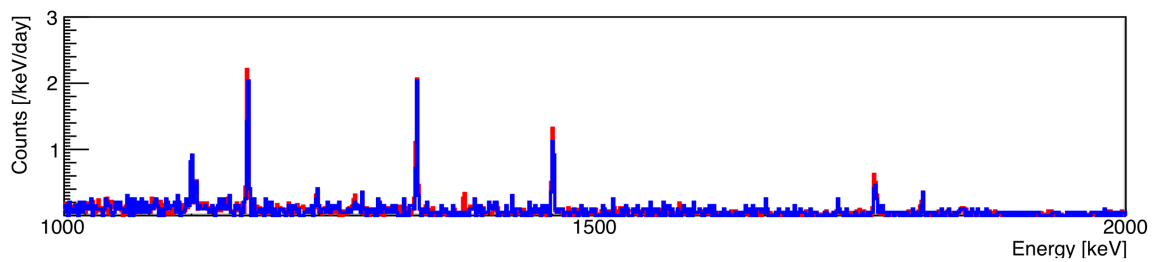
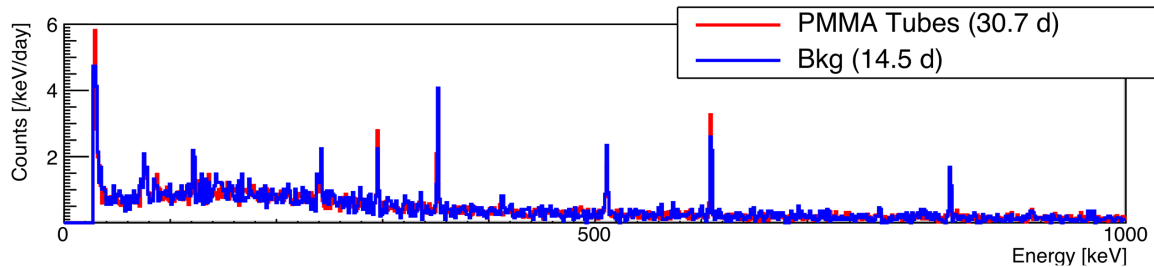
Efficiency



Results:

PMMA – Belmont – 29.7 d live time

Mass		0.2134 kg							
Daughter	Energy	Branching (%)	eff (%)	Final Values		Combined Values		Upper Limits Only	
				mBq/kg	Err	mBq/kg	Err		
U-238	Th-234	92.50	5.58	0.69	<4.47			<4.5	
U-238	Pb-214	295.20	19.20	4.55	7.27	3.63			
U-238	Pb-214	351.90	37.10	4.34	7.65	2.74	7.0	4.4	
U-238	Bi-214	609.30	46.10	3.31	5.08	2.81		<10.9	
U-238	Bi-214	1764.50	15.90	2.04	9.23	6.96			
Th-232	Ac-228	338.30	11.30	4.38	<1.43			<2.1	
Th-232	Ac-228	911.20	26.60	2.80	<2.17		-	<2.1	
Th-232	Ac-228	969.00	16.20	2.71	<3.68		-	<2.1	
Th-232	Pb-212	238.60	43.60	4.97	<1.20			<1.2	
Th-232	Tl-208	583.20	84.50	3.40	<0.72		-	<1.2	
Th-232	Tl-208	2614.50	99.00	1.64	<3.49		-	<1.2	
K-40	K-40	1460.80	10.72	2.27	<15.01		-	<15	
Co60	Co60	1173.20	99.9	2.50	<1.55		-	<1.6	
Co60	Co60	1332.50	99.9	2.37	<1.70		-	<1.6	





## Boulby Underground Germanium Suite

Boulby Mine  
Loftus  
Saltburn by the Sea  
Cleveland  
TS13 4UZ

Additional notes:

There is a peak of unknown origin at 1377 keV. Investigations are ongoing.