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MetroBeta – Project Overview

MetroBeta Workshop, 6 December 2017 | Mark A. Kellett



MetroBeta :: Overview

- **Seven partners – project coordinated by CEA**
 - 3 National Metrology Institutes (CEA, PTB, CMI)
 - 3 External funded partners (UHEI, UMCS, Gonitec)
 - 1 Unfunded partner (CHUV)
- **Five objectives**
- **Six Work Packages**
- **Ten deliverables**
- **Project duration: 1 June 2016 – 31 May 2019 (3 years)**
- **Budget: 1.3 M€**

MetroBeta :: Objectives

➤ Five Objectives

- 1. To improve modern measurement techniques for silicon detectors (Si(Li)), solid scintillator crystals (LaBr₃/CeBr₃) and magnetic spectrometers for measurements of beta spectra. (WP3)**
- 2. To optimise beta spectrometers, based on Metallic Magnetic Calorimeters (MMCs), and measure new high resolution beta spectra for low (<100 keV) and intermediate (<1 MeV) end-point energy pure beta emitters Sm-151, C-14, Tc-99 and Cl-36. (WP2)**
- 3. To improve theoretical computation methods and compare the measured and calculated beta spectra. (WP1 and WP4)**
- 4. To investigate the effect of improved beta spectra on absolute activity measurements and measure Bremsstrahlung cross-sections to quantify their effect. (WP4)**
- 5. To facilitate the take up of the technology and measurement infrastructure developed by the project by the measurement supply chain (accredited laboratories, instrumentation manufacturers) and end users (the nuclear medicine community and the nuclear power industry). (WP5)**

➤ Six Work Packages

WP No	Work Package Title	Active Partners (WP leader in bold)	Months
WP1	Theoretical calculations of beta spectra (X. Mougeot)	CEA ; UMCS	41.5
WP2	High-resolution beta spectrometry based on Metallic Magnetic Calorimeters (MMCs) (J. Beyer)	PTB ; CEA; UHEI	61.0
WP3	Measurements of beta spectra with other methods (F. Juget)	CHUV ; CMI; Gonitec	27.8
WP4	Comparison and validation of measurements (K. Kossert)	PTB ; CEA; CHUV	16.0
WP5	Creating impact (P. Kovar)	CMI ; all partners	11.5
WP6	Management and coordination (M.A. Kellett)	CEA ; all partners	11.0
Total months			168.9

MetroBeta :: Deliverables (1)

➤ Deliverables D1 – D5 (Technical)

Relevant objective	Deliverable number	Deliverable description	Deliverable type	Partners (Lead in bold)	Delivery date
3	D1	Paper on the improved theoretical computation methods submitted to a peer-reviewed journal	Paper	CEA, UMCS	May 2019 (M36)
1	D2	Summary report on measured beta spectra for P-32, Cl-36, Sr-89, Sr-90, Y-90, Tc-99, Pm-147, Lu-176 measured with silicon detectors (Si(Li)), solid scintillator crystals (LaBr ₃ /CeBr ₃) and magnetic spectrometers	Summary report	CHUV, CMI, Gonitec	May 2019 (M36)
1	D3	Summary report on the improved measurement techniques for silicon detectors (Si(Li)), solid scintillator crystals (LaBr ₃ /CeBr ₃) and magnetic spectrometers for measurements of beta spectra	Summary report	CMI, CHUV, Gonitec	May 2019 (M36)
4	D4	Summary report on the Bremsstrahlung cross-section measurement and comparison with literature	Summary report	CHUV	May 2019 (M36)
2	D5	Good Practice Guide on the use and development of Metallic Magnetic Spectrometers (MMCs) for beta spectrometry	Good Practice Guide	CEA, PTB, UHEI	May 2019 (M36)

MetroBeta :: Deliverables (2)

➤ Deliverables D6 – D8 (Technical)

Relevant objective	Deliverable number	Deliverable description	Deliverable type	Partners (Lead in bold)	Delivery date
2	D6	Summary report on high-resolution spectra of pure beta emitters Sm-151, C-14, Tc-99 and Cl-36 measured with an optimised beta spectrometer based on Metallic Magnetic Calorimeters (MMCs)	Summary report	CEA, PTB	May 2019 (M36)
4	D7	Validation report on the effect of improved beta spectra on absolute activity measurements	Validation report	PTB, CEA	May 2019 (M36)
3	D8	Summary report showing the comparison between measured and calculated beta spectra	Summary report	CEA	May 2019 (M36)

MetroBeta :: Deliverables (3)

➤ Deliverables D9 – D10 (Non-technical)

Relevant objective	Deliverable number	Deliverable description	Deliverable type	Partners (Lead in bold)	Delivery date
5	D9	<p>Evidence of contributions to new or improved international standards with a specific focus on recommendations for improved beta spectra shapes usage in activity of radionuclides measurement, to be submitted to EURAMET TC-IR, ICRM Beta Spectrometry WG, ICRM Liquid Scintillation Counting WG, and DDEP and accreditation authorities in Europe.</p> <p>Examples of early uptake of project output by the measurement supply chain (accredited laboratories, instrumentation manufacturers) and end users (the nuclear medicine community and the nuclear power industry).</p>	Reporting documents	CMI, all partners	May 2019 (M36) + 60 days
n/a	D10	Delivery of all technical and financial reporting documents as required by EURAMET	Reporting documents	CEA, all partners	May 2019 (M36) + 60 days

Conclusion

- **The project started on 1 June 2016**
- **Each Work Package has a leader who coordinates the partners within their WP**
- **A binding agreement has been signed with EMPIR and we are committed to undertake the necessary research to produce the deliverables**
- **The elected Management Board (1 member per partner) will oversee the administrative side of the project**
- **The elected Committee of EURAMET NMIs and DIs will deal with any problems in the consortium – although there will not be any!**
- **Collaborators can be brought into the project, but they cannot be directly involved in producing a project deliverable**



Thank you for your attention



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