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## Status report of the first AMS laboratory in the Czech Republic at NPI, Řež

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The first Accelerator Mass Spectrometry (AMS) laboratory in the Czech Republic has recently been established within a consortium of Nuclear Physics Institute (NPI) of the Czech Academy of Sciences (CAS), Faculty of Nuclear Sciences and Physical Engineering of the Czech Technical University in Prague (CTU in Prague – FNSPE) and the Institute of Archaeology of the Czech Academy of Sciences, Prague. The laboratory has been built in new premises of NPI, Řež. It is equipped with a 300 kV Multi-Isotope Low-Energy AMS system (MILEA) developed in a collaboration of Ionplus AG and ETH Zurich, Switzerland. MILEA has been designed, but not limited to, for determination of  $^{10}\text{Be}$ ,  $^{14}\text{C}$ ,  $^{26}\text{Al}$ ,  $^{41}\text{Ca}$ ,  $^{129}\text{I}$ , isotopes of U, Pu and other actinoides. This device serves for a national project “Ultra-trace isotope research in social and environmental studies using accelerator mass spectrometry”, acronym RAMSES. Factory and on-site acceptance tests (FAT and SAT, respectively) of MILEA carried out or assisted by Ionplus specialists were finished in summer of 2021 and showed favourable parameters, e.g., blank ratios for the individual rare/stable isotopes. SAT values for the main measured nuclides listed below show that MILEA system at NPI is competitive with large AMS systems. Noteworthy, MILEA is equipped with the Ionplus Gas Interface System (GIS) for direct measurements of  $^{14}\text{CO}_2$  allowing analysis of ultra-small samples containing only 3 to 100  $\mu\text{g}$  of carbon.

- $^{10}\text{Be}/^9\text{Be}$ :  $< 1.4\text{e-}15$
- $^{14}\text{C}/^{12}\text{C}$  (graphite samples):  $8\text{e-}16$  –  $9\text{e-}16$
- $^{14}\text{C}/^{12}\text{C}$  (gaseous samples):  $< 2\text{e-}14$
- $^{26}\text{Al}/^{27}\text{Al}$ :  $< 2.6\text{e-}15$
- $^{129}\text{I}/^{127}\text{I}$ :  $1.9\text{e-}14$  –  $7.1\text{e-}14$
- $^{236}\text{U}/^{238}\text{U}$ :  $4.5\text{e-}13$  as abundance sensitivity.

Here we present our first results, mainly  $^{14}\text{C}$  measurements and uncertainties of blanks and standards and sample preparation procedures for determination of  $^{10}\text{Be}$ ,  $^{26}\text{Al}$ , and actinoids.

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**Primary author:** Prof. KUČERA, Jan (Nuclear Physics Institute of the CAS)

**Co-authors:** Dr PACHNEROVÁ BRABCOVÁ, Kateřina (Nuclear Physics Institute of the CAS); Prof. NĚMEC, Mojmir (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering); Dr KAMENÍK, Jan (Nuclear Physics Institute of the CAS); Dr SVĚTLÍK, Ivo (Nuclear Physics Institute of the CAS); Prof. JOHN, Jan (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering); Dr TECL, Josef (Nuclear Physics Institute of the CAS)

**Presenter:** Prof. KUČERA, Jan (Nuclear Physics Institute of the CAS)

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