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Building of the first AMS laboratory in the Czech Republic –Extension of the CANAM infrastructure

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Building of the first AMS laboratory in the Czech Republic has recently been started in co-operation of the Nuclear Physics Institute of the Czech Academy of Sciences (NPI), the Faculty of Nuclear Sciences and Physical Engineering of the Czech Technical University in Prague and the Institute of Archaeology in Prague of the Czech Academy of Sciences. The laboratory will be located on the premises of NPI in Řež and equipped with an accelerator with maximum terminal voltage 1 MV, a complex of new laboratories, including the class ISO 7 clean laboratory, and offices. The AMS system should be capable of measuring low levels of ^{14}C , cosmogenic radionuclides ^{10}Be and ^{26}Al , actinides, namely isotopes of U and Pu, and selected fission products, e.g., ^{129}I . The application fields of ^{14}C measurement will involve

- Radiocarbon dating in archaeology, paleoecology and other disciplines
- Bomb peak dating for environmental protection and forensic medicine
- Environmental and geological studies, detection of environmental changes
- ^{14}C in the atmosphere and in the vicinity of nuclear power plants
- Atmospheric $^{14}\text{CO}_2$ and ^{14}C environmental levels (reference background values)
- Green vs. fossil carbon ^{14}C in motor fuels (HVO), pharmaceuticals, foods and chemical industry
- Microdosing of pharmaceuticals labeled with ^{14}C

The applications of ^{10}Be and ^{26}Al measurement will involve

- Geochemistry and paleoclimatic change studies (sediments, rocks, glaciers, ...)
- Age determination of meteorites and other extraterrestrial materials
- Determination of cosmogenic nuclides

The measurements of actinides and fission products will be applied for

- Geochronology, environmental control and monitoring
- Natural fission and neutron reactions
- Nuclear forensics and Safeguards, undeclared nuclear activities, nuclear weapon explosions

The new AMS laboratory will complement the existing NPI infrastructure Centre of Accelerators and Nuclear Analytical Methods (CANAM) that comprises at present three laboratories—Laboratory of Cyclotron and Neutron Generators, Laboratory of Tandetron and Neutron Physics Laboratory. The new AMS laboratory will become the fourth laboratory of CANAM and should be operational at the beginning of 2020.

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