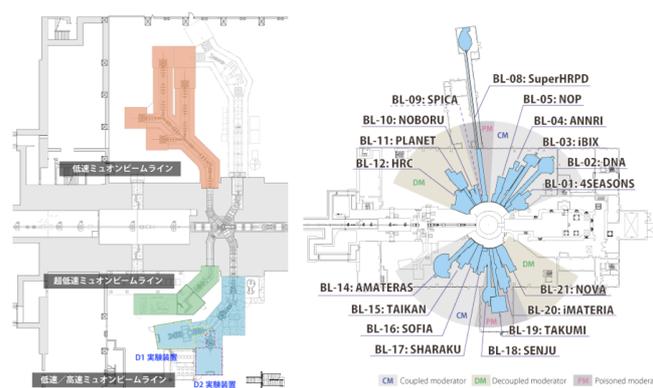


Elements Strategy Initiative in J-PARC

Toshiji Kanaya : J-PARC MLF

Material and Life Science Experimental Facility (MLF) in Japan Proton Accelerator Research Complex (J-PARC) is a neutron and muon experimental facility for material and life science researches. Accelerated proton beam comes into MLF from 3GeV Rapid Cycle Synchrotron at a repetition rate of 25 Hz to produce neutron and muon. In the facility there are 20 neutron and 3 muon instruments operating for user program. The facility agrees with the purpose of the Elements Strategy Initiative and is cooperating within a special framework of beam time using JAEA and KEK instruments. As a result MLF contributed to the project to produce some excellent outcomes such as discovery of 2nd antiferromagnetic parent phase in hydrogen-doped LaFeAsO superconductor [1], observation of tunneling motion of hydrogen atom highly influenced by conduction electrons, cage electron-hydroxyl complex state as electron donor in mayenite [2]. However, the facility caused troubles to the initiative due to the Great East Japan Earthquake at 2011, Hadron incident at 2013 and troubles in the neutron target at 2015 in addition to lack of close cooperation between the project and the facility. In order to use the facility effectively we have introduced the long term general proposal system in which a facility scientist joins the proposal to support the measurement, sample environment and data analyses.

J-PARC MLF has produced many fruitful results in academic research as well as in industrial researches, inspired by the Elements Strategy Initiative. For example, all-solid ceramic battery and high functional automobile tire have been developed based on the basic academic researches in the project. In the talk, we will introduce some instruments characteristic in J-PARC MLF, which will be able to contribute to the researches in the Elements Strategy



Neutron (right) and muon (left) instruments in J-PARC MLF.

Initiative. One is a high pressure instrument and another is energy resolved neutron imaging instrument. It is expected for them to greatly contribute to new material production in the initiative.

Bibliography

- [1] M. Hiraishi, et al.; Nature Phys., **10** 300 (2014)
- [2] M. Hiraishi et al.; Phys. Rev. B **93**, 121201(R) (2016)

External links

<https://j-parc.jp/MatLife/ja/index.html>