M2_1: Minisymposium "High brilliance compact neutron sources – status and perspectives", part 1

Tuesday, Sept. 20, 2016, 10:45 – 12:15. Session Chair: Thomas Gutberlet
Location: Hörsaal D

10:45 – 11:30: **The HBS Project: A High Brilliance Neutron Source (ID 264)**
Thomas Brückel, Ulrich Rücker, Tobias Cronert, Paul Zakalek, Thomas Gutberlet, Jörg Voigt, Yannik Beßler, Michael Butzek, Jan Philipp Dabruck, Paul-Emmanuel Doege, Rahim Nabbi, Carsten Lange, Marcel Klaus

11:30 – 11:50: **RIKEN Accelerator-driven Compact Neutron Source, RANS, and its Practical Applications (ID 263)**
Yoshie Otake

11:50 – 12:10: **Solid State Chemistry and Neutron Powder Diffraction (ID 262)**
Richard Dronskowski

RIKEN Accelerator-driven Compact Neutron Source, RANS, and its Practical Applications

Yoshie Otake
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RIKEN accelerator-driven compact neutron source (RANS) has been developed and provided neutrons for industrial use. The proton linac of 7MeV with the maximum average current 100 uA, pulse width 10us-180us, repetition frequency 20-200Hz is used with long-life Be target for such practical use in the field of manufacturing. The success of the visualization of the corrosion and the water movement with wet-dry process under the film in the normal steel and corrosion –resistant alloy steel samples with RANS has clarified high potential of compact neutron source for metal and steel samples. The texture evolution due to plastic deformation was successfully observed by measuring a change in the diffraction peak intensity using TOF measurements with 2D detector, furthermore, the volume fraction of the austenitic phase in the dual phase mock specimen was also successfully evaluated by fitting the diffraction pattern using a Rietveld code. Another important mission of our project is to develop novel non-destructive inspection system for large scale infrastructures such as pre-stress concrete bridges with transportable compact neutron source including high sensitive detector system. The difference of the number of the steel bars in the thick concrete slab successfully distinguished with the new pixel fast neutron imaging detector, the air gap and the water under the thick concrete block are also measured. For more compact neutron source, we plan to construct RANS2 with 2.49MeV proton linac. The further plan will be discussed in the presentation.