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Recent upgrades and current status of cold-neutron disk-chopper spectrometer AMATERAS

AMATERAS, cold-neutron disk-chopper spectrometer at the Materials and Life Science Experimental Facility in J-PARC, has been in operation since 2009 [1]. Due to its high flexibility of the neutron intensity and the energy resolution, AMATERAS has been used for experiments in various research fields such as magnetism, functional materials and so on. Recent issues of AMATERAS are the high competition rate in the user program, inefficiency of beamtime due to frequent changing of sample environment and resultant working loads of the staff. In order to improve such situation, we have been upgrading the instrument these past few years. Associated with refurbishment of the cryopump on the vacuum scattering chamber in 2019, we introduced a gate valve on it and automated the pumping system of the vacuum scattering chamber. Furthermore, we extended a short guide mirror downstream of the monochromating chopper by replacing a B_4C collimator with it. While we gained the neutron flux, it yields a new background at a low-Q region. In this talk, details of the upgrades and current status of AMATERAS will be presented.

[1] K. Nakajima, S. Ohira-Kawamura, T. Kikuchi, M. Nakamura, R. Kajimoto, Y. Inamura, N. Takahashi, K.Aizawa, K.Suzuya, K.Shibata, T.Nakatani, K.Soyama, R.Maruyama, H.Tanaka, W.Kambara, T. Iwahashi, Y. Itoh, T. Osakabe, S. Wakimoto, K. Kakurai, F. Maekawa, M. Harada, K. Oikawa, R. E. Lechner, F. Mezei, M. Arai, J. Phys. Soc. Jpn. 80 (2011) SB028.

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