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Current State of Japanese Engineering Diffractometer, RESA-1

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RESA-1 is an angular-dispersive neutron engineering diffractometer installed in the JRR-3 guide hall of the Japan Atomic Energy Agency. This is a large-scaled engineering diffractometer, which can measure the residual stress inside materials at centimeter-order depth non-destructively. The gauge volume is normally defined using the radial collimator and incident cadmium-slit. Optionally, the vertical convergent slit, which can limit the gauge height at a measurement position, can be installed in the incident neutron beam path alternatively to provide a large sample space. RESA-1 has a cryogenic load frame with the load capacity of 10 kN. The in-situ deformation behaviour can be evaluated by neutron diffraction at 5 K in minimum temperature. Furthermore, the quarter type Eulerian cradle enables us to measure crystallographic texture of metals. Unfortunately, JRR-3 has been suspended since 2011 due to the Great East Japan Earthquake Disaster. Nevertheless, we are making efforts to upgrade the RESA-1 continuously for future restart. New type Z-stage was lately developed to realize a long travel distance in vertical within a range of 300 mm. Furthermore, we have developed lately high intensity monochromator system, an automatic controlled double focusing Si bent perfect crystal monochromator with multiple Si(400) wafers stacked. Recently we have some fatal problems in not only RESA-1 but also any other instruments in JRR-3 during long term stop, aging degradation of electrical equipment. It is urgent for us to solve these issues since JRR-3 restarts.

Formal Invitation Letter Required

No

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