SALSA: RESIDUAL STRESS DETERMINATION USING NEUTRONS

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In the two years since it became available to users SALSA has matured into a world-class neutron diffractometer for the evaluation of residual stress. Making use of the high neutron flux available at the Institut Laue Langevin (ILL) reactor in Grenoble, allows rapid measurement of local macrostrain at significant neutron beam penetrations. The availability of flexible collimator or slit optics allows gauge volumes to be defined which are appropriate for both bulk and near-surface studies.

In this paper we present the current technical status of the SALSA instrument and discuss futures aims and perspectives for strain measurement using neutrons at the ILL. We present the performance of the instrument against current standards and present examples of application to stress problems. In particular we discuss how concurrent developments using high-energy X-rays at the neighbouring European Synchrotron Radiation Facility (ESRF) are leading users to utilise both neutrons and X-rays to fully understand residual stress in industrial components.