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**Neutron resonance spectrometry for temperature measurement during dynamic loading**

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NRS has been used to measure the temperature inside a metal during shock loading. The initial experiments on Mo at the LANSCE accelerator gave higher than expected temperatures. We have reconciled the temperatures with the known properties of Mo by considering strength and curvature of the shock, demonstrating that the NRS measurement worked as intended. We have developed improved designs for the explosively-driven projectiles and NRS configurations used at LANSCE: these should give much flatter shocks with less explosive, allowing NRS to be used for a wider range of studies. Pulsed neutrons can also be produced by nuclear reaction of laser-accelerated ions. We are investigating the use of high energy short pulse lasers such as TITAN to produce neutron pulses orders of magnitude higher intensity than at LANSCE. Such pulses could be used to make NRS temperature measurements on samples shock or ramp-loaded by nanosecond laser ablation to kb-Mb pressures, enabling a huge range of interesting physics to be explored. Collaborators: James McNaney, Drew Higginson (LLNL); Vincent Yuan (LANL). Work performed under the auspices of the U.S. DOE under Contract DE-AC52-07NA27344.