Contribution ID: **61** Type: **Contributed Oral**

C3Or3B-01: High pressure burst tests at cryogenic temperatures

Wednesday 21 May 2025 14:00 (15 minutes)

So called moderators are key components of a neutron source and are used to slow down high energy neutrons, released by a nuclear reaction, to a required energy. Cold neutrons (ca. 10 meV energy) are required for a variety of experiments, which is why (cold) moderators are an important part of a neutron source. A pressure vessel filled with liquid para hydrogen is for example a suitable cold moderator. The vessel must be made of aluminum with thin walls so that not too many neutrons are absorbed. The challenge is to manufacture an aluminum pressure vessel with minimal material content that meets the high safety requirements of a nuclear facility. Moderators for various facilities have been designed, manufactured and tested at the ITE of Forschungszentrum Jülich. In order to validate the results of the simulations, a test method has been developed in which the moderator vessels to be tested are made to burst at the temperature of liquid nitrogen. In this presentation, high speed camara video sequences showing the explosive failure of various moderators at cryogenic temperatures will be compared with the predictions of dynamic simulations.

Author: ROSENTHAL, Eberhard

Co-authors: BESSLER, Yannick; SCHOENEN, Stephan (Forschungszentrum Juelich GmbH); Dr WILLMS, Holger (Forschungszentrum Juelich GmbH); NATOUR, Ghaleb (Forschungszentrum Juelich GmbH)

Presenter: ROSENTHAL, Eberhard

Session Classification: C3Or3B - New Devices, Novel Concepts, and Miscellaneous III