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## **Materials for nuclear fusion examined by neutrons: Neutron computed tomography on carbon fiber composites for plasma divertors**

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In the Wendelstein 7-x fusion experiment, plasma divertors are employed to delimit the plasma, and to extract thermal energy. Carbon fiber composite (CFC) plates are bonded to water-cooled copper blocks by copper solder that hooks into laser-drilled holes in the CFC.

After extensive irradiation in a plasma test facility, a slight increase in surface temperature was detected which was caused by localized failures in the interface. Three-dimensional high-resolution neutron computed tomography was performed on small cut-out test samples of the interface, and a liquid contrast agent that had penetrated into hollow spaces revealed delamination between the CFC and copper structure, which was caused by large differences in the heat expansion coefficients of the two materials. The tomographic examination yields an important contribution for the detailed interpretation of spatially extended interface failures.

**Author:** SCHILLINGER, Burkhard

**Co-authors:** Prof. LINSMEIER, Christian (Forschungszentrum Jülich); GREUNER, Henri (Max-Planck-Institute für Plasma Physics)

**Presenter:** SCHULZ, Michael

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