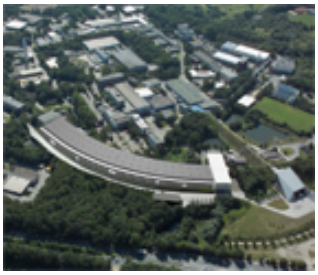

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X-ray diffraction experiments with internally and externally electrically heated DACs

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High-pressure studies provide crucial information for many scientific and industrial applications. Volume changes can produce structural, electronic, magnetic and other phase transitions, initiate chemical reactions, and many other phenomena. During last decades diamond anvil cell (DAC) technique has become the most popular method of pressure generation capable for work in a multimegabar pressure range. However, there still are a number of problems related to high-temperature experiments with DACs. External and internal electrical heating allows generating temperature in a wide range (form 300 K to over 2500 K), relatively easy measuring it (with thermocouples at T<1500 K or spectroradiometrically at higher temperature), maintaining it practically constant (±5 K at 1500 K) during hours. Moreover, in externally heated DAC at T>800 K stresses are practically absent and heating is quite homogeneous. In other words, electrical heating could be a perfect complementary to the laser heating method to study materials at extreme conditions. We demonstrate application of electrically heated DAC on the examples of X-ray diffraction, XANES, NFS and NIS studies of geophysically important materials.

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Session Classification: Dynamic Single Crystal Diffraction at simultaneous high-pressure and -temperatures