

## Synchrotron study of diamond structure

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The forbidden reflections of diamond have been attributed to the scattering by the bonding electrons. Recent interpretations of this effect were all based on pendelloesung data, which are reliable but restricted, due to the limitations in the method, to the ten low-order reflections. The extension of the data set needs single-crystal diffraction exposure performed with monochromatic radiation of low wavelength, preferably with synchrotron radiation.

Several synchrotron data sets of both natural and synthetic diamonds have been collected at room temperature and at 15K, using spherically ground diamonds of diameter not exceeding 0.4 mm. A wavelength of 0.4Å was used for routine intensity measurements and longer wavelength data sets were used to enable corrections for extinction. Silicon crystals of the same size were used to achieve absolute scaling of the data.

Measurements were carried out at the Hasylab synchrotron source at DESY in Hamburg, using a double-stage He cryostat on the Huber diffractometer of beamline D3. The intensities were corrected and reduced to unique data sets by implementing a Wilson type least-squares fit.

Refinement of the various data sets and comparison with existing experimental and theoretical results will be discussed.