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Planar channeling of 855 MeV electrons in a boron-doped (110) diamond undulator - a case study

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A 4-period diamond undulator with a thickness of 20 μm was produced with the method of Chemical Vapour Deposition (CVD), applying boron doping, on a straight diamond crystal with an effective thickness of 165.5 μm . A planar (110) channeling experiment was performed with the 855 MeV electron beam of the Mainz Microtron MAMI accelerator facility to observe the expected undulator peak. The search was guided by simulation calculations on a personal computer. However, an undulator peak was not observed. Implications for the prepared undulator structure are discussed.

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