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Further investigations of a defect-complex in III-nitride ternary semiconductors

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Earlier PAC measurements with 111In in GaN and AlN show a defect complex of the implanted In and a nitrogen vacancy (VN) which is stable up to high temperatures. This could give insights in the not well understood luminescence mechanism.
To gain more information about this complex we compared 111In(111Cd) with 111mCd(111Cd) measurements to check the possible influence of after effects that can occur after the decay of the parent nucleus 111In via electron capture. This leaves a hole in the electron shell of the probe atom.
Furthermore the different relative charges of the incorporated probe atoms can be studied; 111In being neutral and 117Cd(117In), 111mCd(111Cd) forming acceptors.
We present the results from our last two implantations at ISOLDE and compare them with previous measurements. 117Cd and 111mCd were implanted in 3µm thin films of GaN and AlN on sapphire substrate. After thorough annealing we performed temperature dependent PAC measurements.

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