Physical Review Letters 2008 vol.100 N25

Observation of the triplet metastable dtate of shallow donor pairs in AlN crystals with a negative-U behavior: A high-frequency EPR and ENDOR study

Orlinskii S., Schmidt J., Baranov P., Bickermann M., Epelbaum B., Winnacker A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Theoretical predictions about the n-type conductivity in nitride semiconductors are discussed in the light of results of a high-frequency EPR an ENDOR study. It is shown that two types of effective-mass-like, shallow donors with a delocalized wave function exist in unintentionally doped AlN. The experiments demonstrate how the transformation from a shallow donor to a deep (DX) center takes place and how the deep DX center can be reconverted into a shallow donor forming a spin triplet and singlet states. © 2008 The American Physical Society.

http://dx.doi.org/10.1103/PhysRevLett.100.256404