

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

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Abstract

Theoretical predictions about the n-type conductivity in nitride semiconductors are discussed in the light of results of a high-frequency EPR and 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.

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