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A Systematic Methodology for the Analysis of Multicomponent Photoreflectance Spectra Applied to GaAsBi|GaAs Structure

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The multicomponent responses of photoreflectance spectrum is experimentally studied using selective phase analysis. After several experimental tests, the phase diagram of vanadium- doped GaAs|GaAs in region of fundamental energy shows only one component. On the other hand, the PR spectrum of GaAsBi|GaAs structure reveals at least two contributions relative to fundamental band–band transition and FKO for GaAs and/or GaAsBi layers. A successful separation of different components is realized by the help of adequate phase angle. We seem that the separation of contributions is useful to extract the values of the physical parameters for each region of the studied structure. We have detailed the methodology and the experimental procedure to identify each contribution.

Keywords: photoreflectance, phase analysis, multicomponent, GaAsBi.