

Response

The author is grateful to the referees for their reviews and mostly positive evaluations of the paper. The specific questions and concerns are addressed below.

Reviewer 2

Comment 1 “In the introduction, some other fluorescent materials can be added for comparison, such as carbon quantum dots, graphene quantum dots, etc. References available: Sci. Adv., 2020, 6, eabb6772. ; Molecules, 2021, 26, 4994.”

Response: I think that other fluorescent materials are not relevant to this work. The topic of the paper (even in the most general view) is “photoluminescence from point defects in crystalline semiconductors”. It has no relation to luminescence from quantum dots.

Comment 2. A schematic diagram of the material needs to be added, so that the reader can understand this article at a glance.

Response: The studied material is just GaN crystal. I do not think that any schematic diagram is relevant here. However, I added some details in the “Materials and Methods” section: “Carbon-doped 1 μm -thick GaN layers were grown on top of 1.7 μm -thick undoped GaN on sapphire substrates by MOCVD ... [17]”.

Comment 3. “Morphological and structural characterization of materials, such as atomic force microscopy and transmission electron microscopy, needs to be added, so that factors affecting optical properties can be more clearly seen.”

Response: The paper is devoted to the analysis of fine structure in photoluminescence from carbon impurities in GaN. Morphological or structural characterization of materials is beyond the scope of the paper. Some basic characterization was done by producers of the studied samples and published in Ref. [17]. The following description is included in the “Materials and Methods” section: “The high crystal quality of the samples was confirmed by scanning transmission electron microscopy measurements [17]. The concentration of carbon, as determined from secondary-ion mass-spectrometry analysis, is $8 \times 10^{17} - 7 \times 10^{18} \text{ cm}^{-3}$, and the samples are high-resistivity. The properties of three GaN:C samples studied in this work are similar to the properties of sample MD91 studied in Ref. [9] and samples of series C in Ref. [17], where other details can be found.”.