

Peer Review

Review of: "A High-Performance All-Silicon Photodetector Enabling Telecom-Wavelength Detection at Room Temperature"

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An interesting paper that, however, should be improved. My comments:

- From a quick web search, I see that the literature on Si:Te detectors is quite wide. Perhaps the authors should add more references and compare the performances of their device to literature devices exploiting the same technology. Try a Google search for “Silicon tellurium doped detectors.”
- About the extrinsic absorption mechanism on Si:Te, it would be nice to have some more data or references on the Si:Te bandstructure and bulk absorption response spectrum, e.g., as a function of the Te dopant density.
- I am quite confused about the fact that the authors present two different devices, a vertical one (Fig.1) and a lateral one whose structure is described in the text with no figure, and then provide in Fig. 2d the wavelength response of the lateral structure only (that clearly has an inferior responsivity vs. the vertical one). What is the wavelength response of the vertical structure?
- The authors claim that the dark current is superior to that of Ge on Si detectors. Please provide some data to support this claim.
- It seems to me that among the high power saturation mechanisms of the vertical device (whose cross section is quite small), there is no mention of E-field screening due to carrier generation. Besides, the authors mention the Auger recombination as a competing mechanism reducing the number of collected carriers. Did they make any numerical simulation on that? In general, was the design of the “active” part of the device supported by some TCAD tools? Please comment.

Declarations

Potential competing interests: No potential competing interests to declare.