

To: Physica B: Condensed Matter Editorial Board  
Subject: Article Submit

Dear Editors,

Enclosed with this letter you will find the electronic submission of manuscript entitled “Modeling the impact of iron defect variability on silicon solar cell performance across different scenarios” by Oleg Olikh and Oleksii Zavhorodnii.

It is widely recognized that defects can significantly alter the properties of semiconductors, and understanding the mechanisms behind these alterations is essential for optimizing solar cell efficiency. Over the years, researchers have accumulated considerable knowledge about various defects, with the iron-boron pair in silicon being a particularly well-studied example. Our investigation builds on this foundation by examining the impact of iron-related defect variability on the performance of silicon-based solar cells, integrating both modeling and experimental validation.

Our research reveals that changes in short-circuit current provide the most reliable method for estimating iron impurity concentrations, significantly improving over traditional techniques. We also found that the behavior of open-circuit voltage is non-monotonic at low boron doping levels, indicating a complex interaction between doping and defect dynamics. We believe that our research not only enhances the understanding of iron-related defects but also has practical implications for developing methods to characterize silicon solar cells. Given the growing interest in renewable energy technologies, we are confident that our findings will resonate with your readership and stimulate further exploration in this area.

This is an original paper which has not been simultaneously submitted as a whole or in part anywhere else. No elements of the work have been published in any form. No conflict of interest exists in the submission of this manuscript.

We would very much appreciate if you would consider the manuscript for publication in the *Physica B: Condensed Matter*.

Sincerely yours,  
Oleg Olikh and Oleksii Zavhorodnii  
Taras Shevchenko National University of Kyiv  
Kyiv 01601, Ukraine  
E-mail: olegolikh@knu.ua