

Supporting Information

Revealing the beneficial effects of Ge doping on $\text{Cu}_2\text{ZnSnSe}_4$ thin film solar cells

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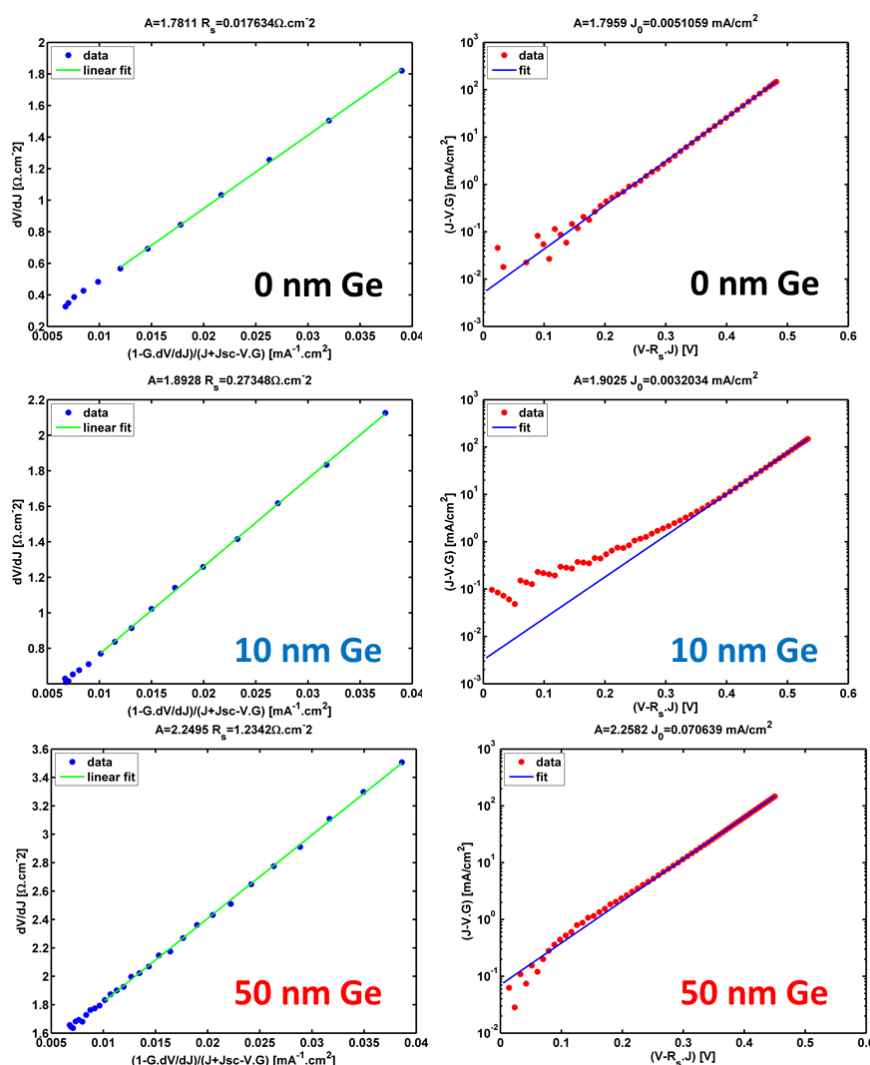


Figure S1. Extraction of series resistance, diode factor and J_0 using the method of Sites et al.[1,2]

Additional References:

- [1] J.R. Sites, P.H. Mauk, Diode quality factor determination for thin-film solar cells, *Sol. Cells.* 27 (1989) 411–417.
- [2] S.S. Hegedus, W.N. Shafarman, Thin-film solar cells: device measurements and analysis, *Prog. Photovolt. Res. Appl.* 12 (2004) 155–176.

