Advanced Formation of Solar Cell Device Structures

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Controlling Impurity Types in Silicon Solar Cells by Forming Localised Molten Regions

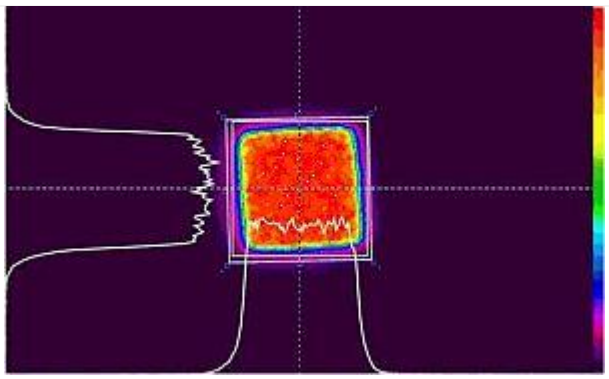
The Technology

UNSW Engineers have developed manufacturing techniques that control the type and concentration of impurities up to 20 microns from the surface of silicon wafers. Controlling the impurities allows desirable structures to be formed, which enhance the performance and durability of photovoltaic devices.

The Deep Junction Technology overcomes limitations such as the use of high temperatures and high energy bombardment of atoms, which are limitations of conventional methods. The Deep Junction Technology controls impurities up to 5 times greater depth compared to standard approaches.

The technology manipulates laser parameters to alter the effectiveness of the diffusion and segregation process in order to control impurity profiles. As a result desirable device structures can be formed, for example formation of junctions. An added advantage of this technology is its ability to tailor structures in individual silicon wafers.

The Deep Junction method produces high quality silicon wafers and offers a cheaper alternative to Plasma Enhanced Chemical Vapour Deposition, Ion-assisted deposition, E-beam deposition, and sputtering to name a few.



UNSW Engineers have developed techniques to control impurities in silicon wafers.

Key Benefits

- Increased durability of silicon wafers
- Cheaper silicon wafer processing
- Ability to create new cell structures
- Suitable for mono-, multi- and thin film silicon
- Suitable for solar cell fabrication for R&D and industrial applications

The Opportunity

NewSouth Innovations is seeking collaborative partners to work with the UNSW to develop and commercialise this new technology by means of a license agreement.

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