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The Electrical and Structural analysis of degraded Single Junction Amorphous Silicon Solar Modules[1] GILBERT OSAYEMWENRE, Fort Hare Institute of Technology, ENERGY EFFICIENCY TEAM — This paper outline a systematic approach used in evaluating the quality, performance and reliability of single junction amorphous silicon solar modules (a-Si:H). The analytical techniques include an electrical and structural analysis. These techniques were used to obtain a holistic view of the state of affairs of these readily available PV modules for small stand-alone systems. Specifically, current-voltage (I-V) characterization and scanning electron microscopy (SEM) will be presented as diagnostic tools in this article. The SEM (JEOL, JED-2300) was used to study the surface morphology of the affected region, results show structural damage in the affected regions. The experiment shows that the energy output of the modules varies a degradation variation of 2.5% to 25.7%, was observed. The detailed results will be presented in the final paper. In conclusion, this research established the degradation which occurs and correlate it to the morphological damage. The module with the worst case scenario has an efficiency of 59% decrease, this could be unacceptable in a device where stability is of priority.

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