

Analysis of PV Array Under Partial Shading

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Abstract: *This paper presents the effect of shading on a photo voltaic (PV) array. The PV and VI characteristics of the array observed in different shading cases and give some observations we make some statements and based on these statements one hypothesis is presented: 'One peak occurs at $N \times V_{oc}$ and the next peak occurs at $(N-j) V_{oc}$ where j is the number of rows that have the same current which occurs at $N \times V_{oc}$. The third peak occurs at $(N-j-k) V_{oc}$ where k is the number of rows that have the same current occurring at $(N-j) V_{oc}$ '. After that, we validated and verified this hypothesis with MATLAB Simulink. With this study we can provide the correct information on shading in the PV array. In this study, the TCT configuration of the PV array was analyzed for a complete analysis of partial shading. This study empowers the researcher with partial shading without any advanced techniques or software.*

Keywords: Partial Shading, PV array, TCT, Mismatch Loss, MPPT