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## On mechanical strain effects on semi-conductors: application to solar cells

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The influence of mechanical strain on the conductivity (piezoresistivity) of intrinsic and doped hydrogenated amorphous and microcrystalline silicon (a-Si:H and  $\mu$ -Si:H) thin films as well as indium tin oxide and aluminum doped zinc oxide is studied experimentally under uniaxial tension and compression during which the resistivity both parallel and perpendicular to the applied strain is recorded. The aim of this work is to characterize and model the influence of stress on thin film solar cells in order to evaluate a possible application of strain-induced efficiency enhancement in photovoltaics. Based on the experimental results, analytical and numerical calculations are performed to estimate the influence of strain on p-n and p-i-n junctions. The change in efficiency caused by strains up to  $\pm 0.75\%$  is estimated to be at most  $\pm 0.3\%$ .

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