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Titel des Beitrags: Doped and textured graphene as electrode for organic solar cells

Abstract:
Organic semiconductor solar cells are a promising route to scalable, economically viable, energy conversion technologies due to the potential for development of low-cost, flexible, large-area cells and modules. Graphene electrodes have been recently proposed as promising candidates for ITO replacement. In this work we report the modelling and realization of an organic solar cell with doped and patterned graphene electrodes. From the modeling point of view many aspects are considered such as the degree of interaction of graphene with the polymeric layer, the graphene/polymer electron, the light management improvements induced by structuring graphene as photonic crystal for light trapping in BHJ-SC. From an experimental point of view, graphene films were realized and transferred on glass substrate and solar cells with direct and inverted architectures have been realized on top of it. P and n doped graphene electrodes have been used and the solar cells achieved a maximum efficiency of 1.5% due to the high sheet resistance of the graphene contact (above 1KΩ). Thanks to the introduction of a conductive metallic grid, which
led to a reduction of the sheet resistance of the graphene contact below 150 $\Omega$, an efficiency of 4.4% has been demonstrated.

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**Occurences:**
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