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Probing the doping state of suspended carbon nanotube films by photo-induced voltage response BENOIT ST-ANTOINE, DAVID MENARD, Ecole Polytechnique de Montreal, RICHARD MARTEL, Universite de Montreal — A study of the photovoltage (PV) properties of suspended carbon nanotube films was undertaken. Although absorbance exhibits resonance features, changing the photoexcitation using lasers at two different wavelengths did not impact the magnitude of the observed behaviour. Moreover, increasing the thermalization by exposing the films to nitrogen resulted in a steep decrease of the PV with increasing pressures. Interestingly and contrary to previously reported studies, we also found that the PV could be maximized by illuminating the films at a short distance from the metallic contacts. All these findings reveal that the PV response of suspended films in vacuum is mainly driven by thermal mechanisms. Finally, we were able to reverse the sign of the PV by changing the doping state of the carbon nanotube films. Thus, monitoring the magnitude of the PV appears as a powerful tool for evaluating the doping state of suspended films.

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