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Harvesting of Kinetic Energy of the Raindrops

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Abstract : This paper presents a methodology to harvest the kinetic energy of the raindrops using piezoelectric devices. In the study 1m×1m PVDF (Polyvinylidene fluoride) piezoelectric membrane, which is fixed by the four edges, is considered for the numerical simulation on deformation of the membrane due to the impact of the raindrops. Then according to the drop size of the rain, the simulation is performed classifying the rainfall types into three categories as light stratiform rain, moderate stratiform rain and heavy thundershower. The impact force of the raindrop is dependent on the terminal velocity of the raindrop, which is a function of raindrop diameter. The results were then analyzed to calculate the harvestable energy from the deformation of the piezoelectric membrane.

Keywords : raindrop, piezoelectricity, deformation, terminal velocity
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