CaPo: Innovative Mobile Protection System for Solar Panels Against Hailstorms

Bellini, Andrea (School: Istituto Superiore "Enrico Fermi")
Vanoni, Manuel (School: Istituto Superiore "Enrico Fermi")

Purpose In recent years, the intensification of extreme weather events has caused significant damage to photovoltaic systems in Italy and beyond. This project arises from the need to protect solar panels from such events, ensuring their integrity without affecting panel efficiency. The primary research question was: Is it possible to protect solar panels from hail in an effective and economical way? _____ Procedure A prototype featuring a mobile, perforated structure was developed and positioned above the panels. This structure descends only when a potential hailstorm is detected, leaving the panels fully exposed to sunlight in the absence of extreme weather conditions. The system was tested by simulating mechanical impacts that replicated the characteristics of hail observed during such events. _____ Observations/Results Tests demonstrated that the mobile and perforated structure effectively shields the solar panels from direct hail impacts, preventing both superficial and structural damage. Moreover, the perforated design nullifies the “sail effect”. The efficiency of the panels remains unaffected as the structure intervenes only when necessary. _____ Conclusions The mobile and perforated structure has proven to be a practical and effective solution for protecting solar panels against extreme hail. This scalable system represents a viable solution to an increasingly frequent problem.

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