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Waterless Soiling Monitoring Stations for Solar Photovoltaic Plants

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SI Case #M17-153P

Background

Soiling is a phenomenon that occurs when dust and other particles stick to the active surfaces of solar cells. This decreases the amount of sunlight contacting the cells, which reduces the amount of current and resultant power reaching the power plant. Soiling is a major issue occurring in many climatic regions, especially in desert areas where rainfall occurs less often. In addition to reductions in performance, soiling in solar power plants is considered a major operations and maintenance expense by power plant owners. Therefore, there is a need for an efficient technology for monitoring the amount of energy loss due to soiling of the cells.

Invention Description

Researchers at Arizona State University have developed a leading-edge monitoring station for calculating the soiling rate and energy loss for solar cells. This breakthrough station uses multiple sensors for comparison to one another, to gather data and diagnose soiling losses with increased accuracy regardless of location, tilt-angle, or installation style. Additionally, this highly efficient station requires no water or electrical connections. This clever monitoring station is also able to develop a custom cleaning schedule fully autonomously.

Potential Applications

- Replacement for Water-Based Monitoring Stations
- Location Scout for Future Solar Power Plants
- Forecasting Energy/Economic Net Gain

Benefits and Advantages

- Innovative – Cutting-edge architecture design provides a functioning station in remote and harsh environments

- Ingenious – A novel approach eliminates the need to access water or electricity
- Active – Station provides data fully autonomously, removing human error
- Unrestricted – Web-based data monitoring can be accessed from anywhere, anytime
- Versatile – A sleek and simple design provides easy transportation and installation

For More Information

[Professor Tamizhmani's Website](#)