上海光伏展SNEC2020研讨会演讲

演讲题目（中文）：一种基于多米诺模式的屋顶光伏阵列化雪系统

演讲题目（英文）：A Domino-Like Snow Removal System for Roof PV Panels

摘要（中文，描述论文性质、范围、内容、结构、重点以及意义）：

在北纬度较高地区（如加拿大、美国北部、日本东北、德国、中国东北部），一年中有很长时间日平均气温低于0度，积雪难以融化。造成布置于屋顶或建设在野外的光伏发电系统冬季数月无法正常发电，严重影响系统经济效益。而传统的除雪方式包括人工扫雪、喷洒融雪剂等，费时费力且存在损坏光伏板的风险。光伏板冬季积雪问题是目前限制光伏发电系统在北纬度较高地区普及的一个瓶颈。中科大项目团队于2018年末发明了一种无需外部供能的自动化雪系统，通过在朝阳面增设二块竖直放置的光伏板做“种子电源”，给被积雪覆盖的第一级光伏板反向通电，使其发热，随着逐级融雪完成的光伏板越来越多，化雪速度也逐级加快。此系统适合常规光伏板使用，能广泛运用于目前家用屋顶光伏系统和野外大规模光伏电站。

摘要（英文）：

In the high latitudes of the northern hemisphere (such as Canada, Northern United States, Northeastern Japan, Germany, Northeastern China), the daily average temperature is below 0 degrees Celsius for a few months each year, making it difficult to melt snow. It causes the photovoltaic power generation system arranged on the roof or in the field to be unable to generate electricity normally in winter for several months, which seriously affects the economic benefits of the system. In addition, traditional snow removal methods including manual snow removal, spraying of snow-melting agents, etc. are time consuming and laborious, and there is a risk of damage to photovoltaic panels. The snow removal problem of photovoltaic panels in winter is a bottleneck that limits the popularity of photovoltaic power generation systems in high latitudes of the northern hemisphere. Recently our group invented an automated snow melting system without external energy supply. By adding two vertically sunward placed photovoltaic panels as “the seed power source”, the first group of photovoltaic panels covered by snow are reversely energized to generate heat and melt the snow on them. As more and more photovoltaic panels complete snow melting group by group, the speed of snow melting is also gradually increasing. This system can be used with conventional photovoltaic panels, and it can be widely used in domestic rooftop photovoltaic systems and large-scale photovoltaic power stations.

摘要作者：刘文1,2，郑佳楠1，宁效龙1，何必荣3，刘文俊3，李明3，Jan Ingenhoff2

英文：Wen Liu1,2, Jianan Zheng1, Xiaolong Ning3, Birong He3, Wenjun Liu3, Ming Li3, Jan Ingenhoff2

作者单位：1中国科学技术大学物理学院，2中国科学技术大学先进技术研究院，3安徽昂科丰光电科技有限公司

英文：1School of Physics, University of Science and Technology of China, 2Institute of Advanced Technology, University of Science and Technology of China, 3Anhui Angkefeng Photoelectric Technology Co., Ltd.

议题范畴：光伏创新应用

演讲人信息：刘文，中国科学技术大学物理学院光学系，教授，长江学者

Wen Liu, Yangtze River Scholar, Professor of Optic and optical engineering Department, School of Physics, University of Science and Technology of China

演讲人简介（中文）：

中国科学技术大学物理学院光学与光学工程系教授，博导，教育部长江学者特聘

教授。他提出并发展的新型光伏农业系统，2017年获得被誉为科技创新“奥斯

卡”的美国R&D100奖。2018年获得世界可再生能源技术协会（WSSET）年度创新奖。



演讲人简介（英文）：

Wen Liu is currently a professor and doctorial tutor in the Department of Optics and Optical Engineering, School of Physics, University of Science and Technology of China, and he has been awarded as “the Yangtze River Scholar Professor”. He proposed and developed a new photovoltaic agriculture system, which won the American R&D100 award in 2017, and the award is known as the “Oscar” for technological innovation. In 2018, he won the annual innovation award of the World Society of Sustainable Energy Technologies (WSSET).

联系人：刘文

职务：教授

单位：中国科学技术大学物理学院

邮箱：wenliu@ustc.edu.cn

电话：+86 13365512277