

12. Flow-Induced Vibration Energy Harvesting

Introduction: With the increasing demand for renewable energy sources, there is growing interest in developing energy harvesting technologies that can convert mechanical energy from natural flows, such as wind and water, into electrical energy. Flow-induced vibration energy harvesting is one such technology that has attracted wide attention in recent years. Flow-induced vibration energy harvesting involves the use of flexible structures that vibrate in response to the flow of wind or water. The vibrations of these structures can be converted into electrical energy using various transduction mechanisms, such as piezoelectric, electromagnetic, or electrostatic. This technology has the potential to provide a sustainable and reliable source of energy, particularly in remote or off-grid locations. This special session aims to provide an avenue for researchers in this field to share their latest findings and insights on the topic of flow-induced vibration energy harvesting. We will explore the design, modeling, and optimization of energy harvesting devices, as well as the development of new transduction mechanisms and materials. We will also discuss the challenges and opportunities in this direction.

Topics:

- Design and optimization of flow-induced vibration energy harvesting devices
- Multi-physics modeling and simulation of flow-induced vibration energy harvesting systems
- Advanced transduction mechanisms for flow-induced vibration energy harvesting
- Novel materials for flow-induced vibration energy harvesting devices
- Experimental characterization and performance evaluation of flow-induced vibration energy harvesters
- Applications of flow-induced vibration energy harvesting in wind and water power generation
- Integration of flow-induced vibration energy harvesting into wireless sensor networks and Internet of Things devices
- Challenges and opportunities in flow-induced vibration energy harvesting technology

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