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INNOVATIVE WAVE POWER GENERATOR SYSTEM USING DIELECTRIC ELASTOMER

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The wave power generation has attracted attention as one of useful utilization methods for ocean energy. However, the conventional wave generators are large, expensive and unable to efficiently generate electric power with small amplitude waves limiting their widespread usage. To solve these problems, we would discuss the possibilities for a wave power generator using dielectric elastomer (DE) recently developed as a novel method for harvesting renewable energy. DE is a new smart material technology with characteristics and properties not seen in other materials. The basic element of DEs is a very simple structure comprised of thin polymer films (elastomers) sandwiched by two electrodes made of a stretchable material. DEs can operate as an electrically-powered actuator. When a voltage difference is applied between the electrodes, they are attracted to each other by electrostatic forces leading to a thickness-wise contraction and plane-wise expansion of the elastomer. The use of a DE actuator in the reverse mode, in which deformation of the elastomer by external mechanical work is used to generate electrical energy, has been gaining more attention. As DE is very light, inexpensive, and easily formed into multiple layered structures, it can make a very simple and robust direct drive wave power system that is economically viable. DE has moved now from the research and development stage to the commercial domain with research and development on practical applications and furthermore to the mass production stage

Biography

Seiki A Chiba was Executive Director for advanced R&D project development, Stanford Research Institute (SRI International). He served SRI for 22 years. He was supervising advanced R&D programs including Japanese Government projects. Currently, he is serving as CEO and Professor at Chiba Institute of Science. He has published more than 367 papers in the various areas and has been serving as an Editorial Board Member of AWMC, *Industrial Engineering & Management, Steel Structures and Construction, and Journal of Material Science.* He has received his PhD in Metallurgy and Material Science from the University of Wales (Britain). Part of this research was implemented with the subsidy of New Energy and Industrial Technology Development Organization (NEDO) in Japan.

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