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Bond Graph Model of a Thin SHM Piezoelectric Energy Harvester

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This paper presents a Bond Graph model of a SHM piezoelectric sensor used as power harvester. A FE model of the sensor bonded onto a structure subjected to low frequency mechanical vibrations has been developed. The forces applied to the sensor and measured from the FE model have been implemented in the Bond Graph model to obtain the sensor voltage response. An analytical model, providing the voltage response of the sensor subjected to an in-plane displacement field and a simplified FE model representing the sensor alone have been used to check the Bond Graph model. This Bond Graph model provides good correlation with the analytical and simplified FE models. As Bond Graph models also describe the power distribution inside a system, it has been possible with this model to estimate the power harvesting capabilities of different piezoelectric sensors under natural mechanical vibrations.

Ключевые слова:

Содержание.

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