# The Converter of Three-Dimensional Oscillations into Electrical Energy

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Mechanical oscillation is one of the most frequent phenomena; it is a considerable source of energy. In this project, a novel design of the autonomous and reliable converter of 3D mechanical oscillations into the electricity is suggested that includes minimal amount of moving parts. The proposed design is based on the ferromagnetic core with permanent magnets on its ends that is taped between the coils through the gimbal that allows free movement of the unit in three dimensions. The electromotive force generation in the coils is caused due to oscillations of generators body. This design can be used in various applications where 3D mechanical oscillations exist (wind, vibrations of machines on plants, oscillations of transport and engineering constructions, as well). But the most promising area is the energy from sea or ocean waves, where it can be set up as a floating frame on the surface or as a web of small parallel- and series-connected generators. The most of existing wave generators use only the water wave energy, with subsequent transfer of the momentum to rotating element or turbine that are inevitably associated with presence of many kinematic connections. The proposed generator is sensitive to 3D oscillations, it has minimum number of kinematic connections, lack of pistons or springs. The single web-element prototype of 6 mW power has been analyzed. The electricity cost obtained from such energy is varied between $70 and $100 /MW·h. The proposed generator can be used by drilling rigs or oil platforms, buoys, lighthouses, desalination equipment.

**Awards Won:**
Fourth Award of $500