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Contribution to the minimization of vibration of rotating machines

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Abstract : Rotating machines are used in areas as diverse as transport (trains, motorized vehicles, etc.) Production industry, or appliances. The vibrations from them may be disturbing; they are the source of some noise radiated by this machine and are therefore undesirable for users, they can be transmitted to neighboring structures and accelerate deterioration or aging, can also damage the rotating machines themselves. It is therefore of interest to develop methods to reduce the vibration level of the machines, as well as that of their environment directly. These optimization methods (minimization) can minimize the natural vibrations using actuators against vibration generated by actuators requiring external power. The objective of this work is to develop a method of minimizing vibrations of a rotating machine, which aims to reduce the vibrational level of an area of its outer casing. This field can then be used for attachment of this machine and so help to minimize the amount of vibration it transmits to its direct environment. A new method also converges to the global optimum (minimum vibration value), and take into account possible variations of vibrational disturbances to eliminate. It allows a significant reduction of vibrations, without changing the characteristics of the system.

Keywords : Rotating machines, vibration sensors, optimization.