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(57) Abstract :
Title: A TORSIONAL VIBRATION ISOLATOR BASED ON SHEAR MODE OPERATION ABSTRACT A tunable torsional vibration isolation device for a shaft in transmission of power is provided comprising a rigid outer sleeve, a rigid inner stub, an elastic element in the form of magneto-rheological elastomers (MRE) snugly placed in between them. The outer sleeve bears an annular cavity throughout its length, intended to position one edge of MRE; the inner stub positioned inside and coaxially to the outer sleeve and bears an annular cavity throughout its length so as to accommodate other edge of the MRE. The MRE settles in the annular cavity thus provisioned. A permanent magnet or an electromagnet or a hybrid setup comprising both the types of magnets, provides a magnetic field across the elastic element. The MRE element comprises of magnetizable particles dispersed in the matrix of an elastomer, possesses a variable shear modulus which varies with the strength of the subjected external magnetic field. The assembly is so designed that power transmits form the input rigid stub to the output rigid sleeve through the elastic MRE by means of shearing of layers within the elastic member. Based on the field and type of application of the disclosed isolator, the shear modulus of MREs can be manipulated suitably by controlled variation of the subjected magnetic flux and hence a tunable state of torsional vibration isolator working in shear mode is achieved.

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