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(57) Abstract :
A regenerative magnetic levitation suspension system (A) for two-wheeler vehicles is described herein. The system employs an electromagnet (6) positioned between the upper permanent magnet (4) and the lower permanent magnet (5) to achieve contactless suspension damping, reducing mechanical wear and improving ride comfort. A piezoelectric energy harvester (7) converts vibrational energy from suspension movements into electrical energy, which is stored and used to power the electromagnet (6), enabling partial self-sustaining operation. This innovative suspension system enhances energy efficiency, reduces maintenance, and provides a quieter, more durable alternative to conventional mechanical suspension systems, particularly benefiting electric scooters, motorcycles, and e-bikes.

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