Direct-drive linear switched reluctance actuator for automobile active suspension systems

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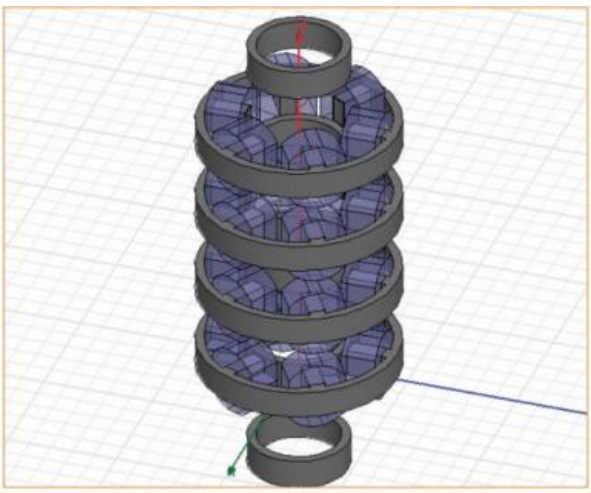
電子控制器樣品
Prototype of electric controller



直線開關磁阻直接驅動器的三維拓撲結構
3D topology of direct-drive linear switched reluctance actuator

Credit: HKPolyU

Researchers in Hong Kong have developed a linear switched reluctance actuator for automobile active suspension system. This system can significantly improve suspension performance and collect suspension energy.

This invention by researchers at The Hong Kong Polytechnic University (HKPolyU) is a linear switched reluctance actuator for automobile active

suspension system. It is an electromagnetic design. The actuator's vertical position (i.e. the vehicles' horizontal level) can be adjusted easily. The response time of the suspension system is much shorter than conventional ones which consist of hydraulic and mechanical parts. It generates control forces to quickly absorb road shocks, suppress vibration and ameliorate both riding safety and comfort.

More importantly, the system can recycle the energy generated from the suspension to charge the vehicle batteries. Taking the electric vehicle "mycar" as an example, this system can save up to about 5% of the energy consumption when riding on countryside roads.

Special Features and Advantages

- Enables active electromagnetic suspension in vehicles, including electric vehicles and petrol cars
- Simple and robust configuration
- Recycles the suspension energy of vehicles (50-300W of electricity could be re-generated during lab test)
- Fast dynamic performance
- Direct drive with high efficiency
- Intelligent force control
- Optimizes the design of linear switched reluctance actuators

Applications

- Active suspension system for vehicles
- Vibration energy recycling system for vehicles
- Power seats with active suspension in vehicles
- Other cases which need active suspension, such as aircrafts and ships

Provided by Hong Kong Polytechnic University