



MAGNETOHYDRODYNAMIC INERTIAL ACTUATOR

Inertia wheel with reduced dimension, high precision, virtually unlimited lifetime and high energy efficiency

Technological benefits

Innovative technology

- No hysteresis torque near zero speed
- No material shaft
- MHD motor using permanent magnet
- PWM type power supply
- Compact and reversible power

A simple and efficient system

- No wear part
- Few mechanical components
- Viscous damping type
- Low micro-vibration level
- Weight is mainly located towards the larger diameter

Invention overview

System based on the use of a fluid conductor placed in a core and driven by an MHD actuator using DC current and permanent magnets.

The inertia wheel thus created is emptied along its rotational axis and does not have moving mechanical parts.

Potential applications

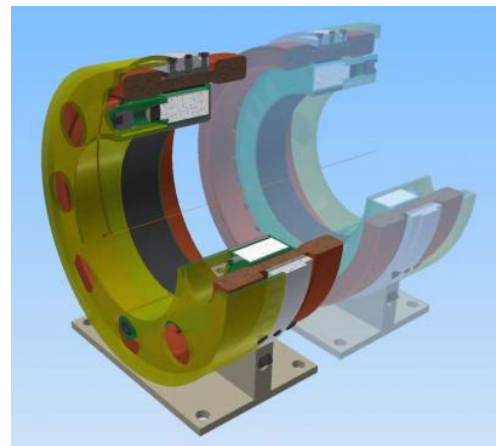
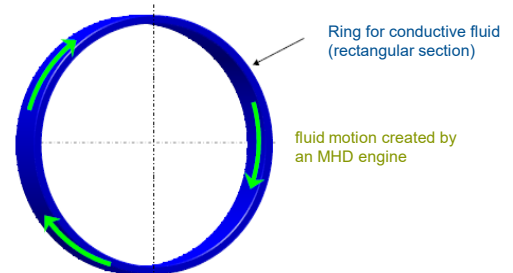
Space

- Inertial actuator for attitude control
- Kinetic wheel for stabilization
- Gyroscopic actuator

Non-space

- Inertial energy storage device
- Attitude control, gyro stabiliser for aircraft, gondola and onboard camera

block diagram of an inertial or reaction wheel MHD



Commercial benefits

Improved performance

- High precision pointing device
- Efficient kinetic moment
- High energy efficiency
- Lower cost

Virtually unlimited life

- Reduced maintenance and very-low risk of breakage

Optimized payload

- Reduced weight and bulk

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*Patented invention, available under license
Part ownership Institut national polytechnique de Toulouse*