

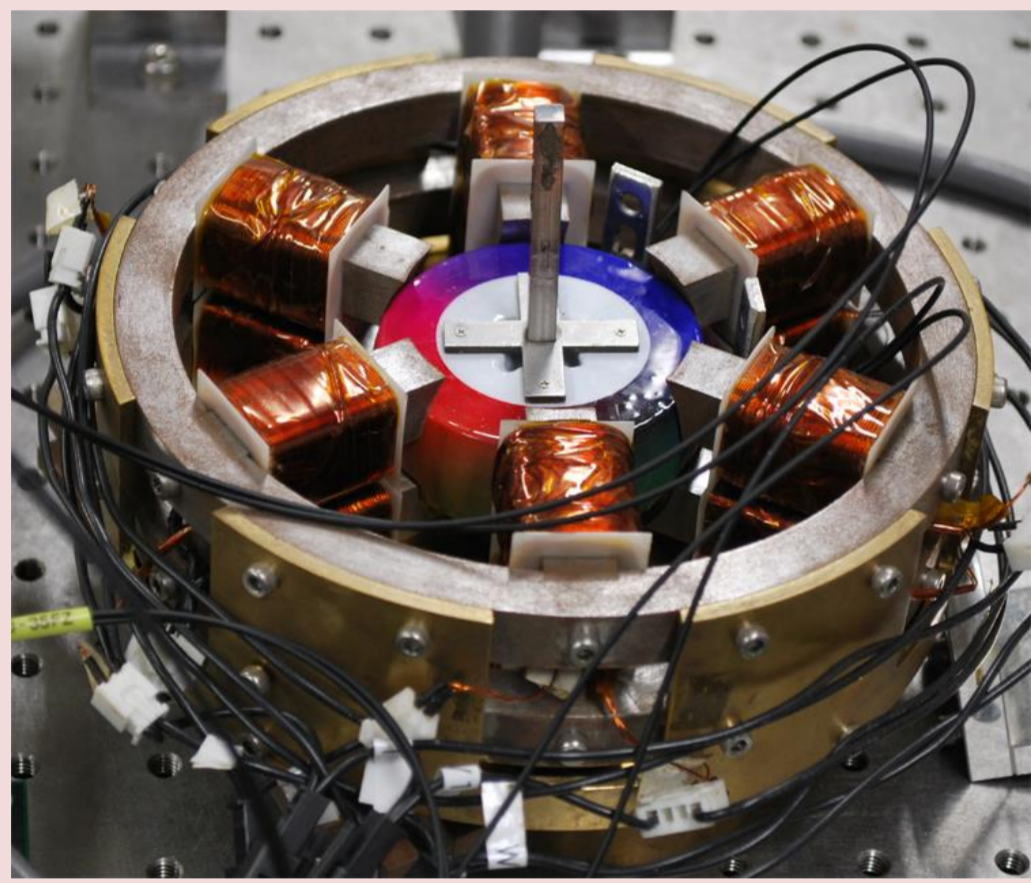
Hirata Laboratory

<http://www.amp.ams.eng.osaka-u.ac.jp/>

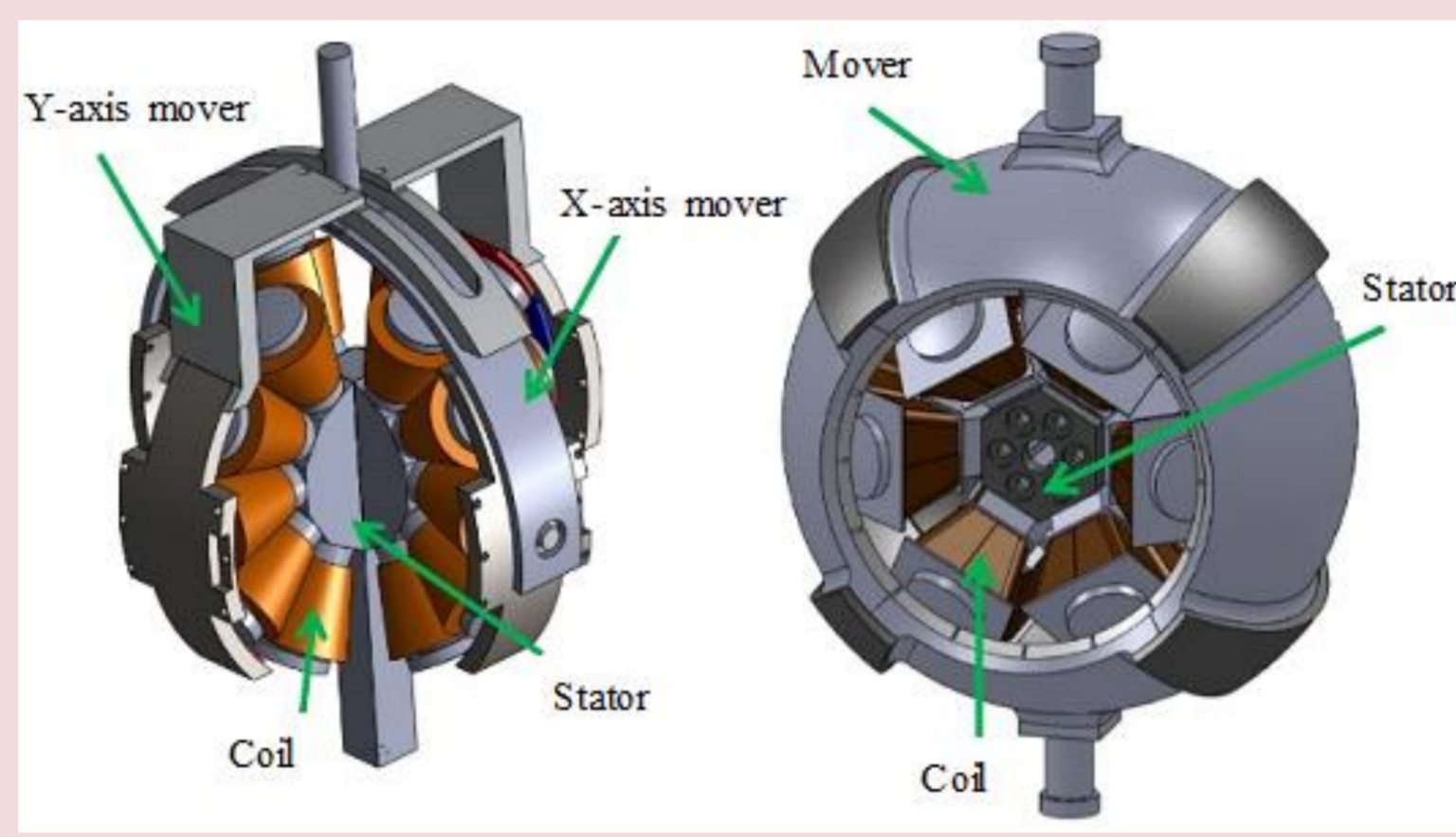
Actuators, sensors, and devices are fundamental technologies of modern science and industry. Our research topics focus on the development of novel electromagnetic actuators, sensors, non-contact transmission devices, control technologies, and design method using finite element method and MPS method, with the aim of creating new robots and electronics.

Actuators for artificial muscles and joints

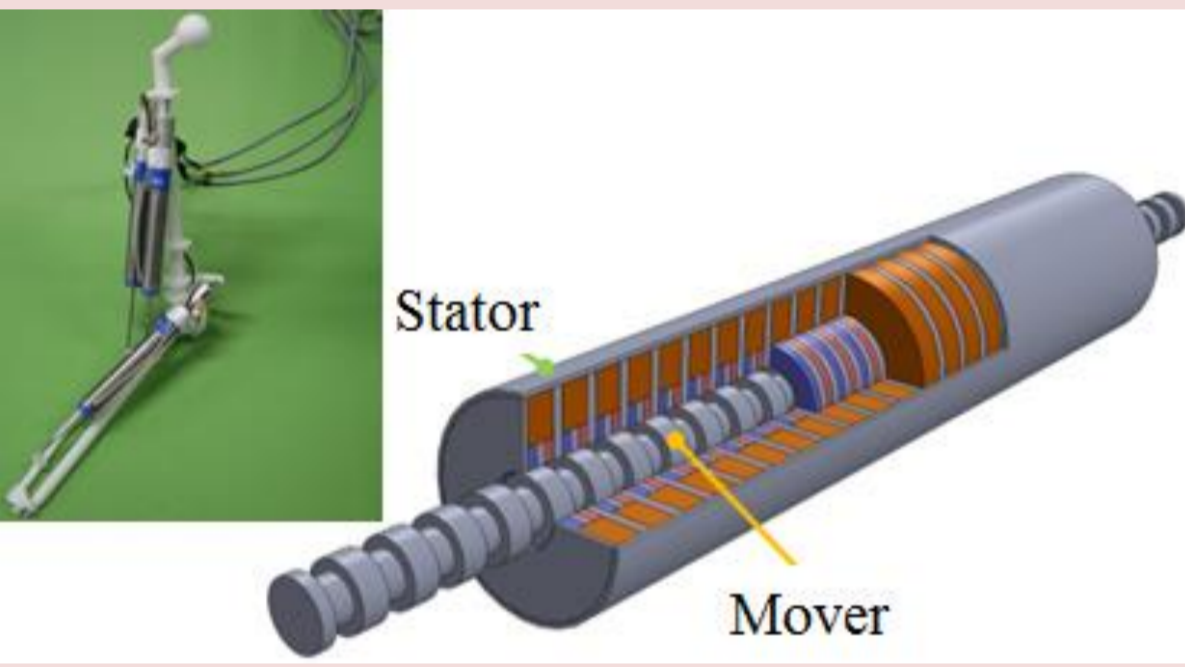
Artificial muscles and joints for android and humanoid robots



3-DOF spherical actuator for humanoid robot joints

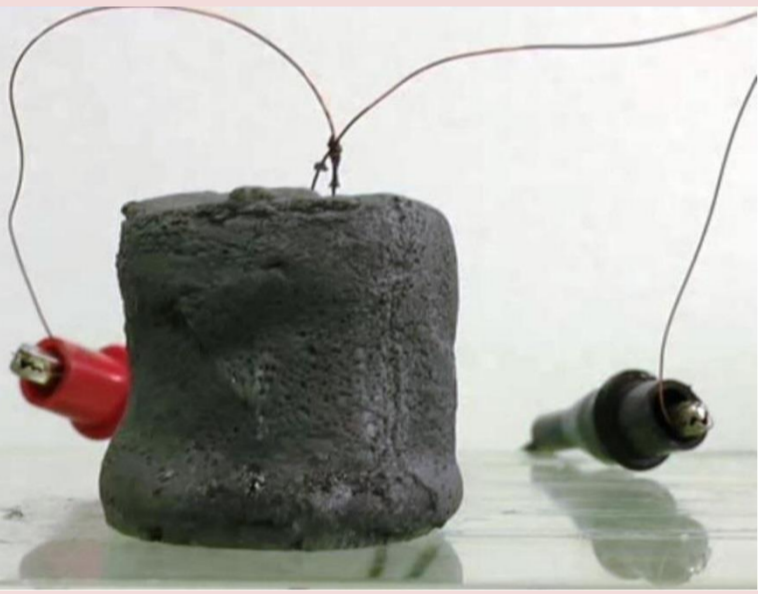


2-DOF spherical actuator for humanoid robot joints



Linear actuator for artificial muscles

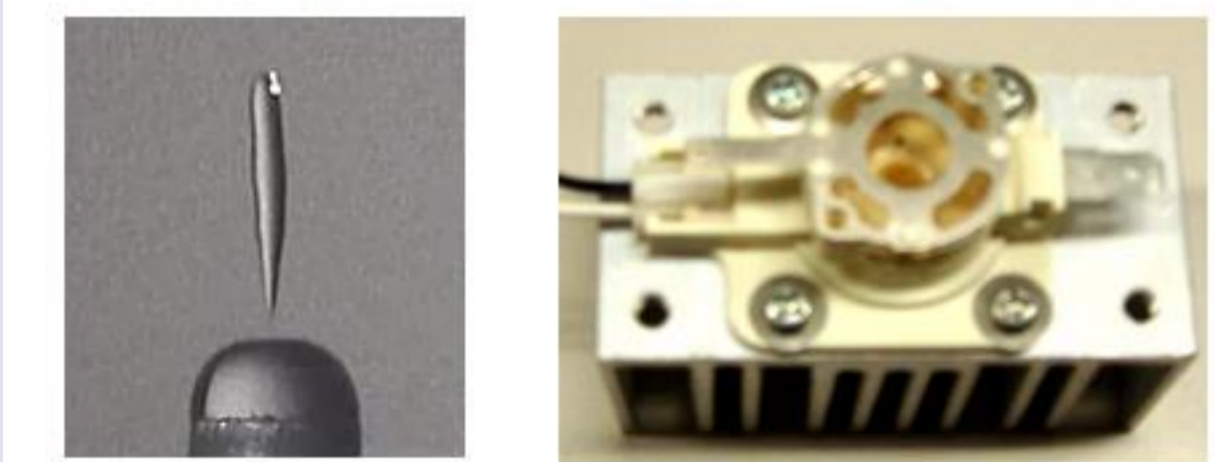
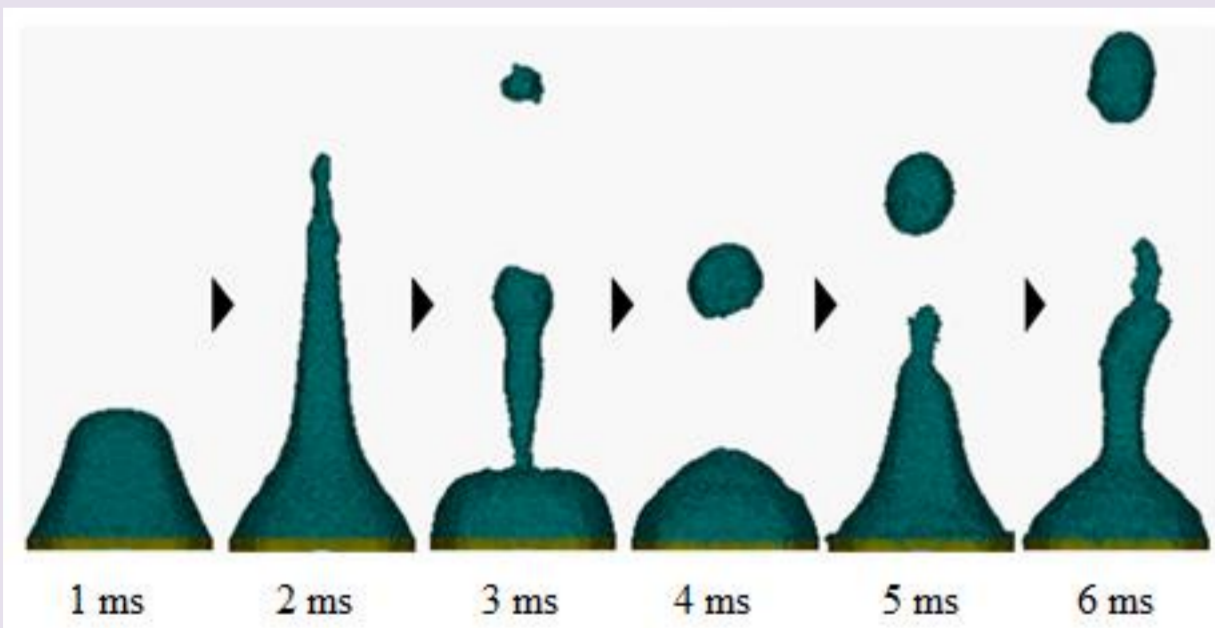
Soft actuators



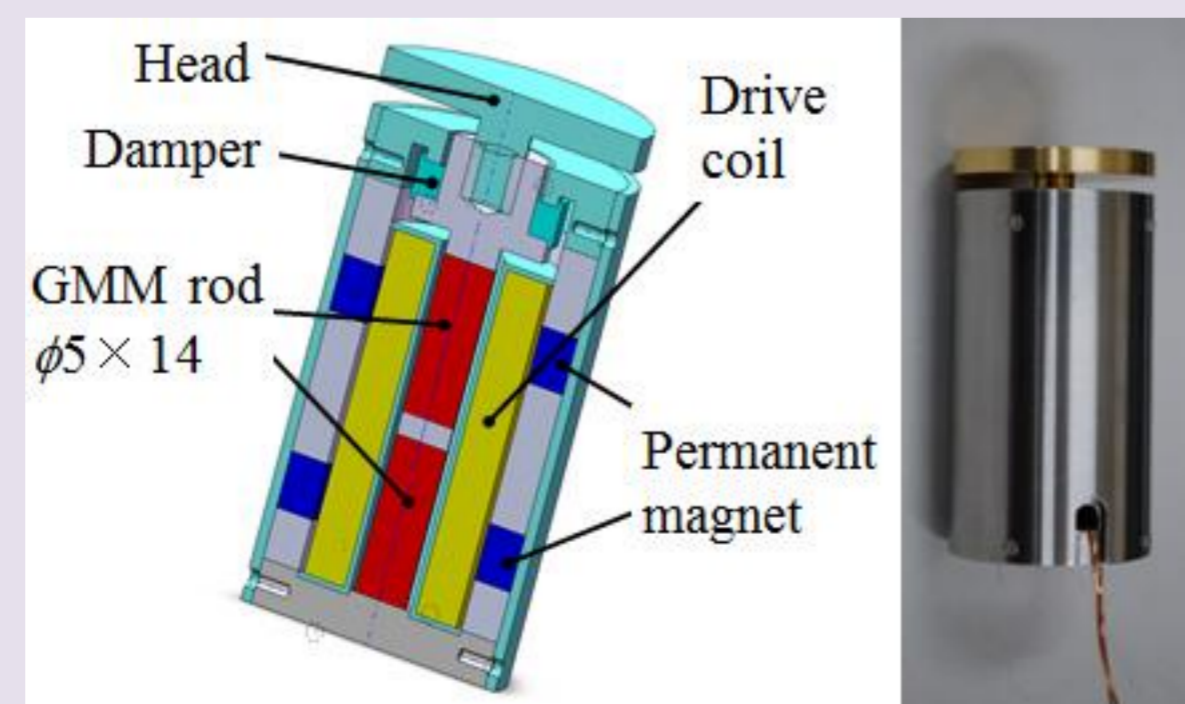
Soft actuators using magnetorheological elastomers

Actuators and devices using new materials and principles

Electrostatic atomization devices

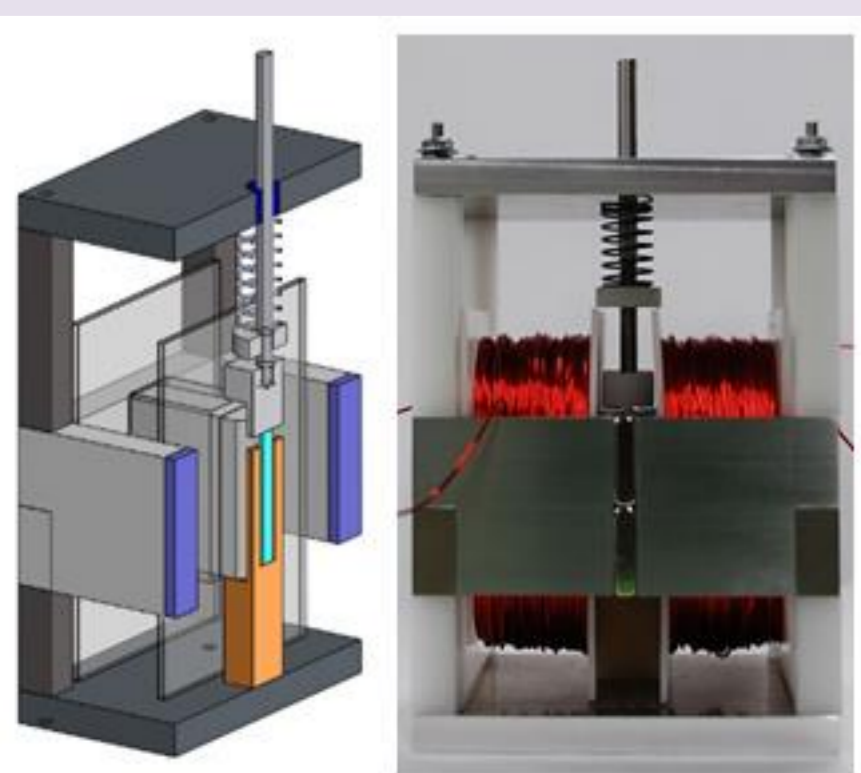


Electrostatic atomization module

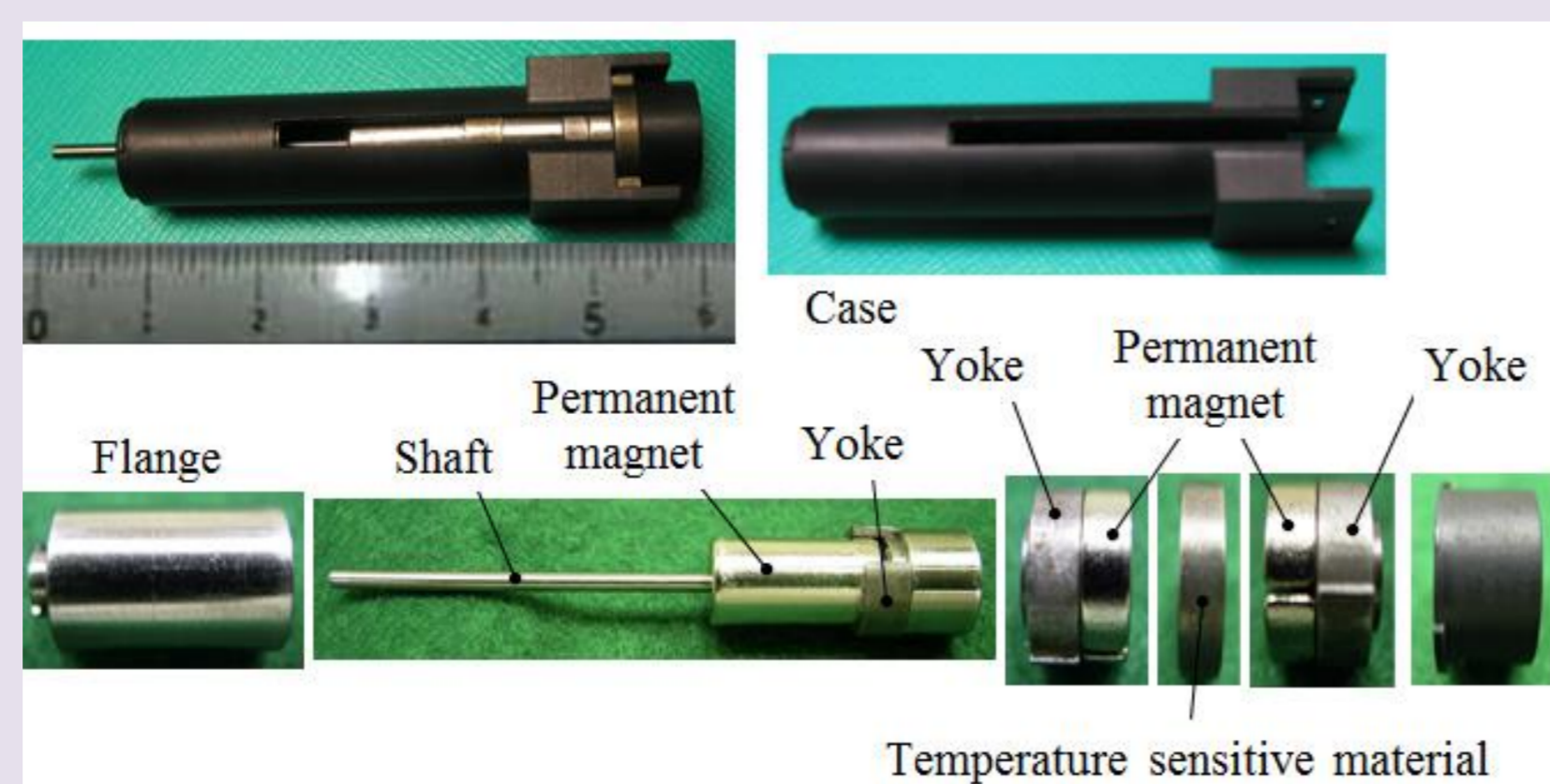


Giant magnetostrictive material actuator

Actuators and devices using new materials

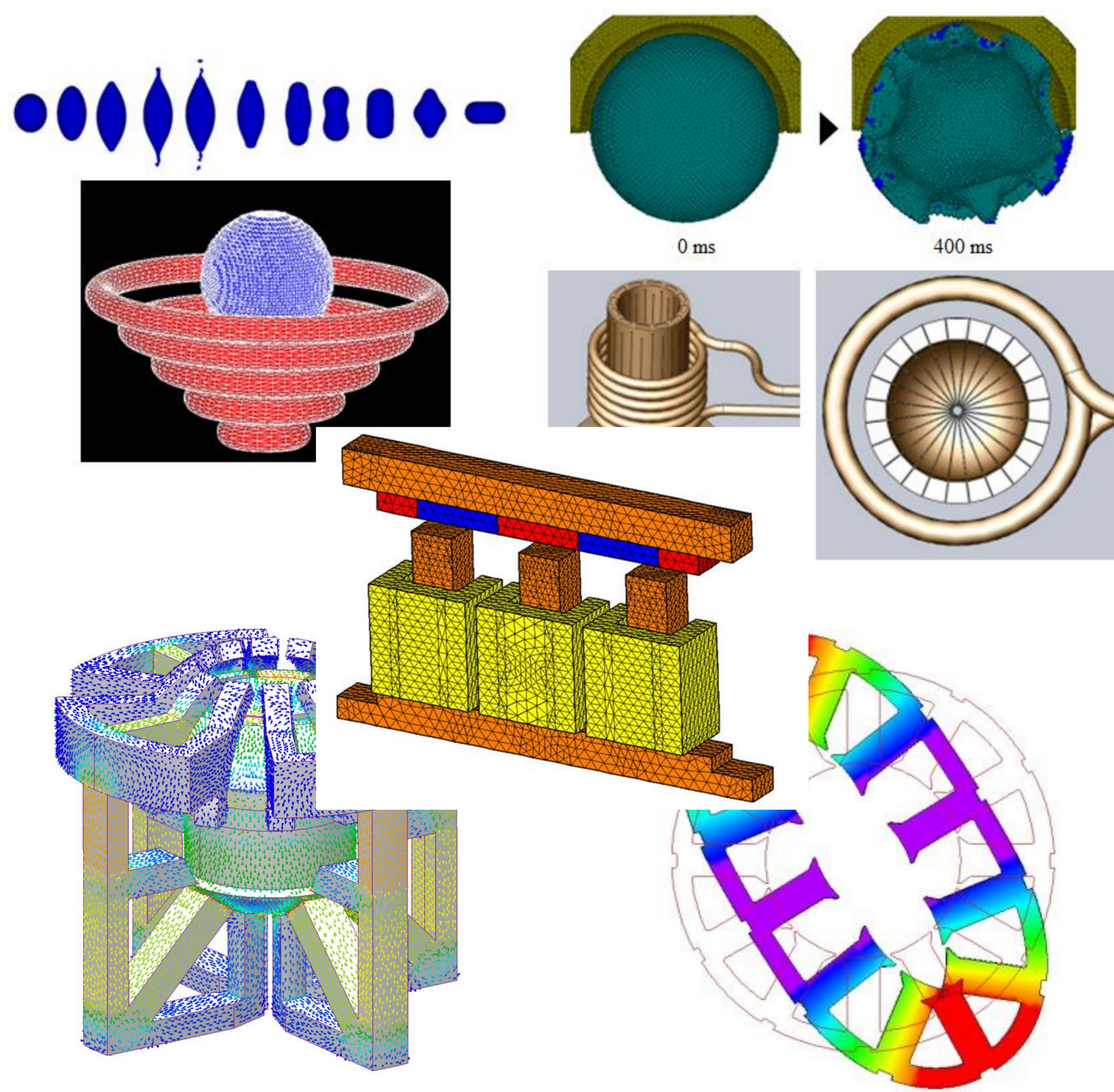


Ferromagnetic shape memory alloy actuator



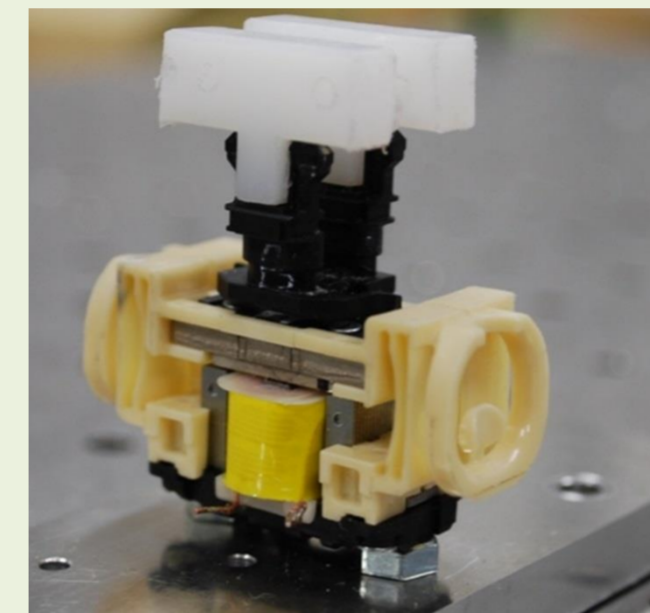
Actuator using temperature sensitive material

Computer simulation (FEM/MPS, multi physics, CAD/CAE)

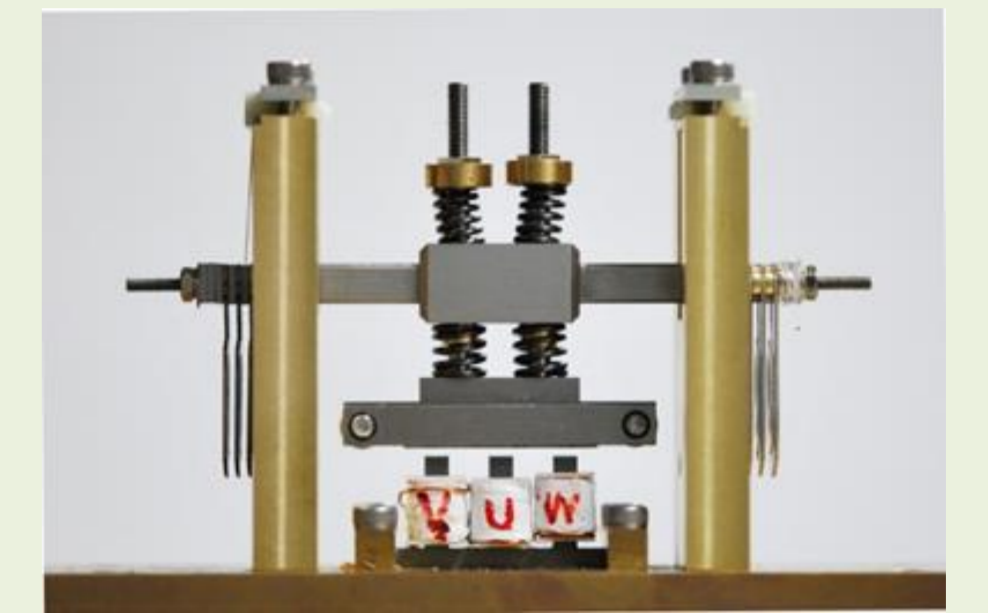


Linear oscillatory and resonant actuators

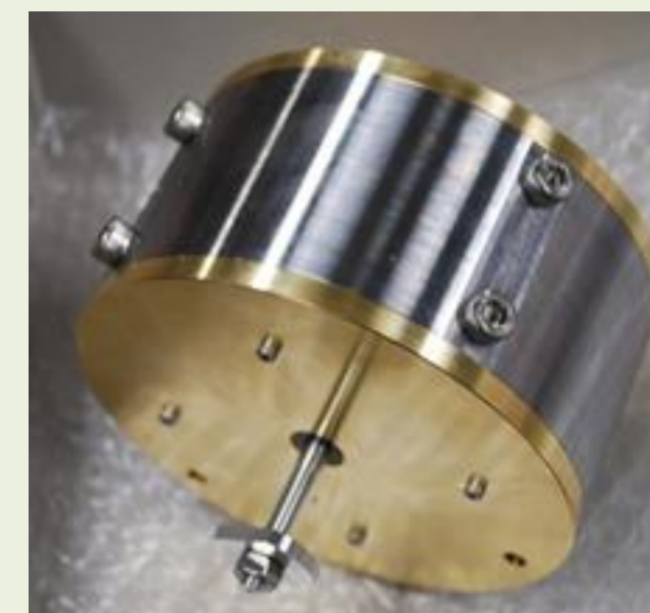
Linear oscillatory and resonant actuators



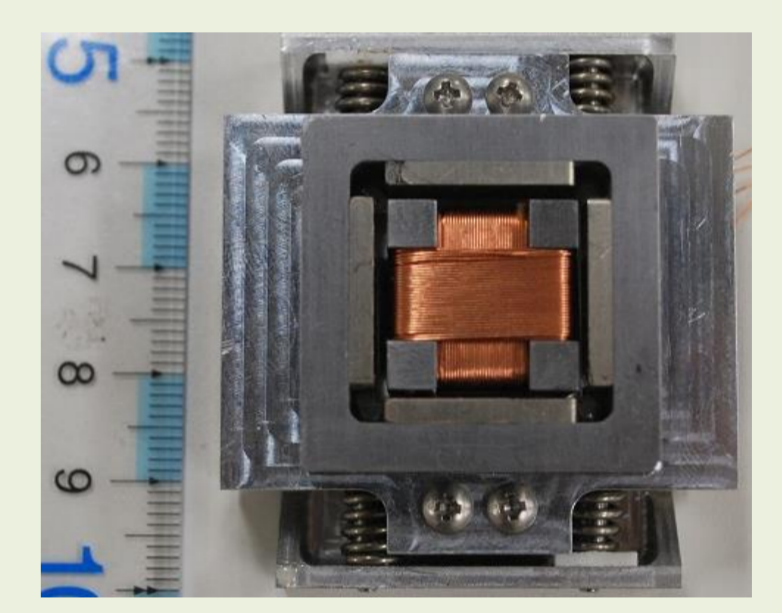
Linear resonant actuator



2-DOF linear resonant actuator

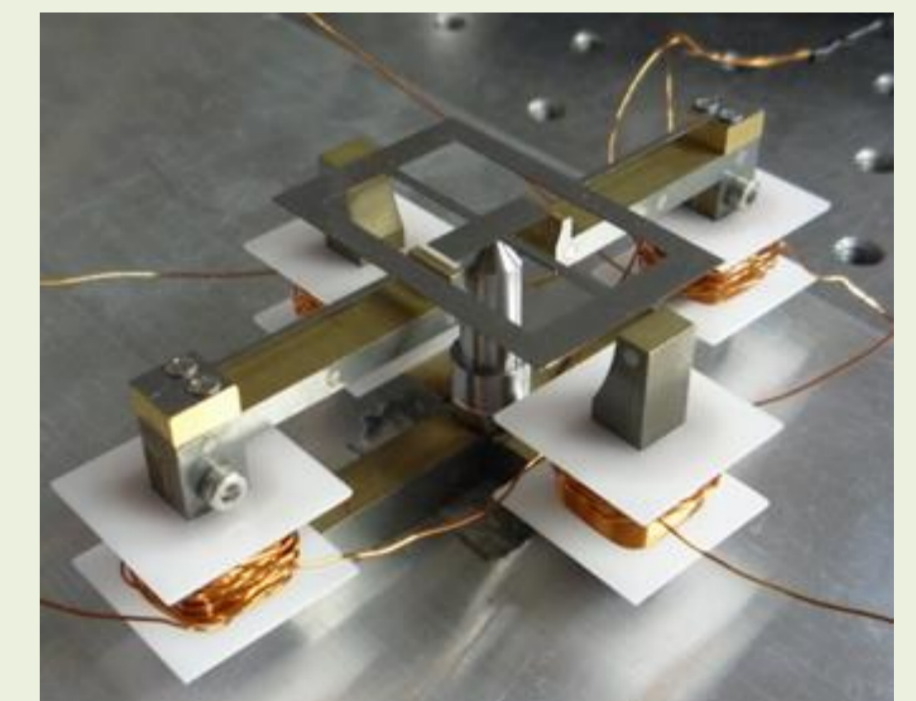


Active control engine mount



2-DOF linear oscillatory actuator for haptic devices

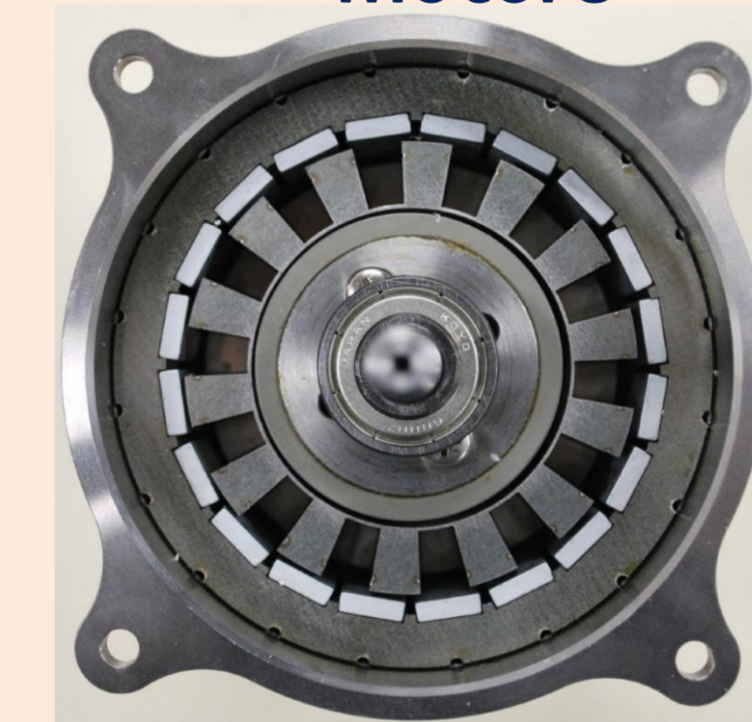
Rotational resonant actuator



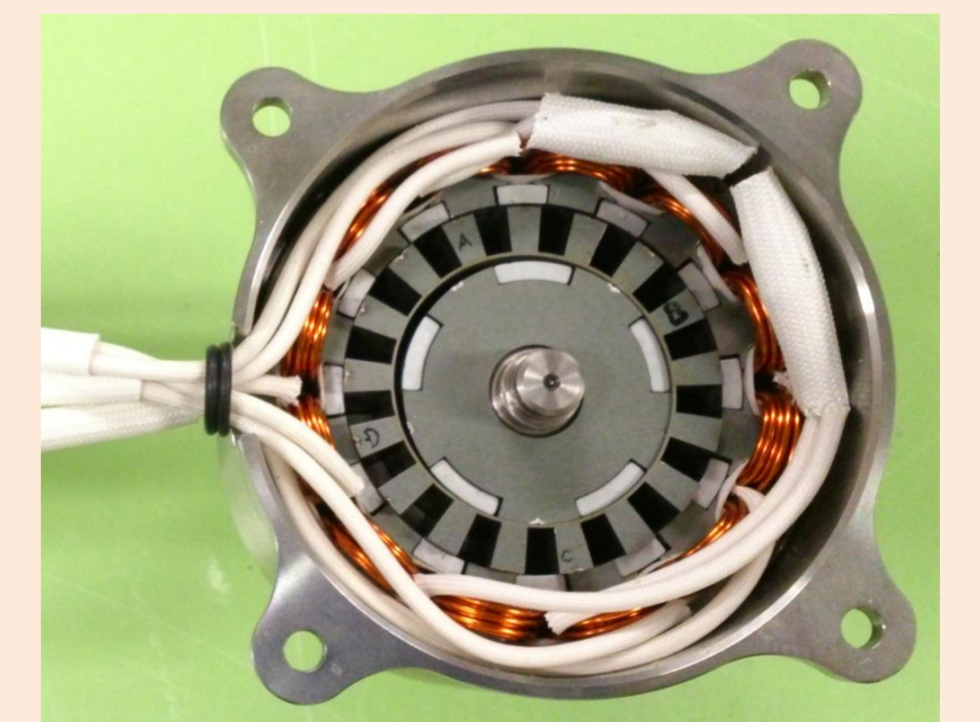
2-dimensional resonant actuator for optical scanners

Magnetic gears and high-torque actuators

Magnetic gear and magnetic-geared motors

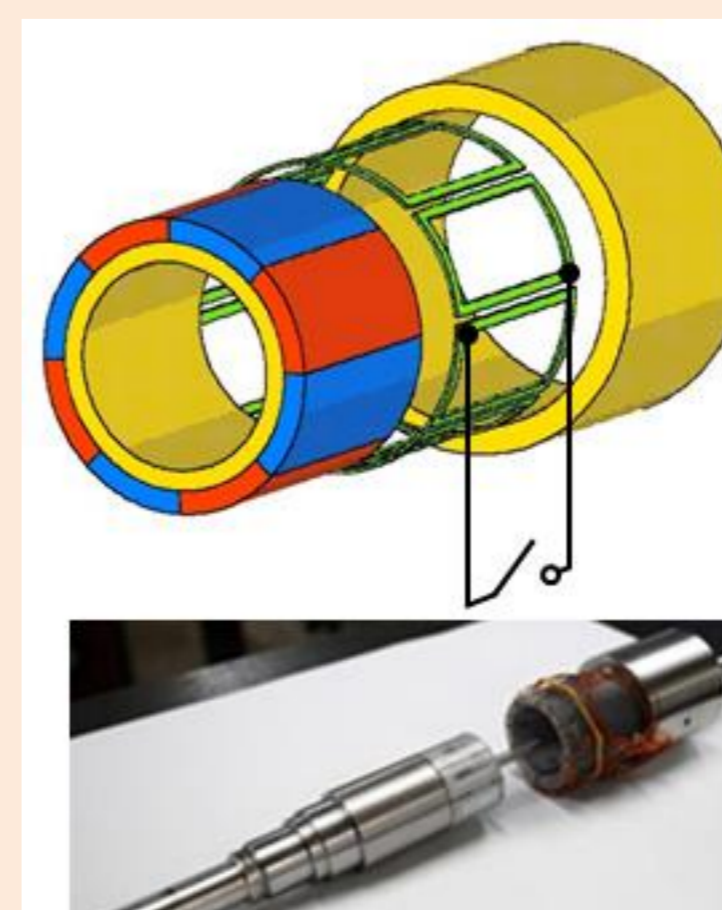


SPM-type magnetic gear



Magnetic-geared motor

Magnetic impact torque device



Impact torque device



Magnetic paradox planetary gear



Magnetic pulley