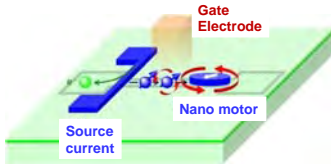
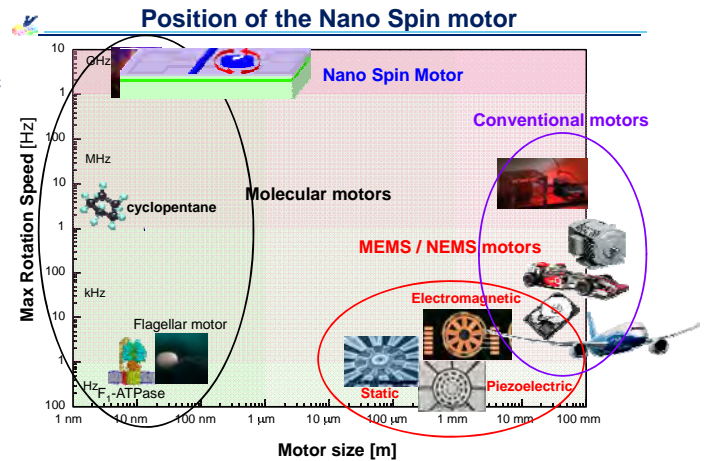


1. Novel Mechanism: Nano-Spin Motor

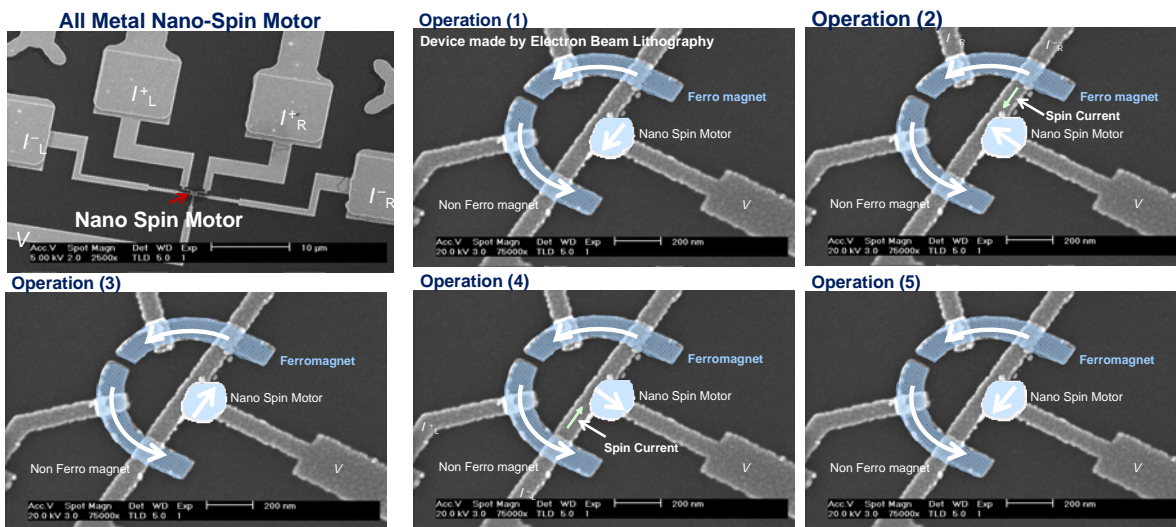
- A magnetic moment in the ferromagnetic nano-disk rotates by the spin-polarized current flowing from the non-magnetic material under the disk.
- High efficiency and high rotation frequency are expected.



	Conventional	This invention
Rotation Frequency	Hz ~ KHz	Hz ~ GHz
Device size	100μm ~ mm	100nm ~ μm

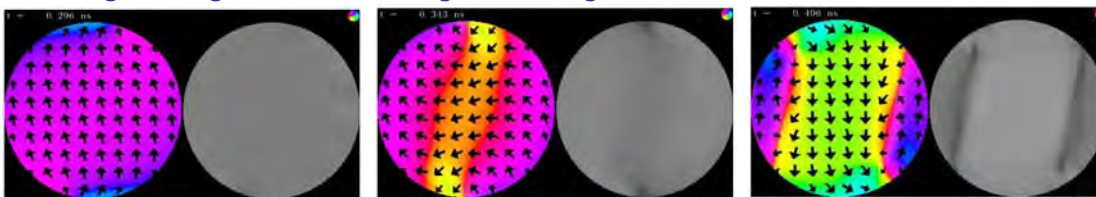


2. Structure and Operation Principle



3. Simulation (Now, under an demonstration stage)

Rotation images of the magnetic moment: Simulation has been executed by using the LLG equation. Left: model diagram Right: differential image of the magnetic domain



Landau-Lifshitz Gilbert Equation

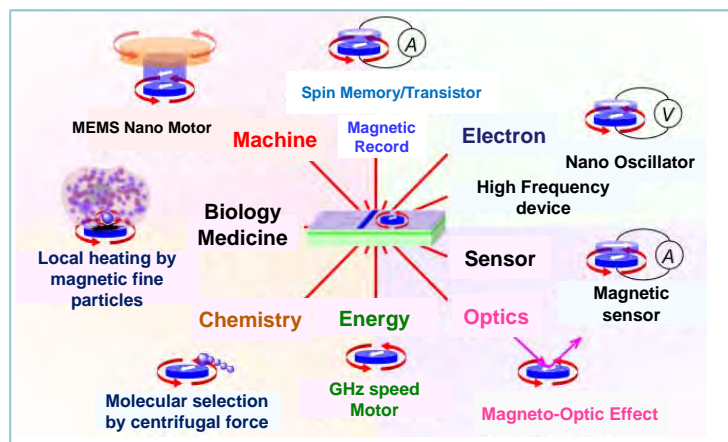
$$\frac{d\hat{m}}{dt} = -\frac{\gamma}{1+\alpha^2} \{ \hat{m} \times \vec{H}_{Tot} + \alpha \hat{m} \times (\hat{m} \times \vec{H}_{Tot}) \}$$

$$\vec{H}_{Tot} = \vec{H}_{eff} + \vec{H}_{ST} \quad (\vec{H}_{ST}: \text{Spin-Torque field})$$

$$\vec{H}_{ST} = -\gamma A_{SL} \times \{ \hat{m}_p \times \hat{m} + \beta \hat{m}_p \}$$

$$\vec{H}_{eff} = -\frac{1}{M_s} \frac{\partial E}{\partial \hat{m}}$$

4. Potential Applications



Patent Licensing Available

Patent No. : WO2014/024697

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