Mechanical-to-Electrical Energy Conversion
2. Fundamental of mechanical to electrical energy conversion

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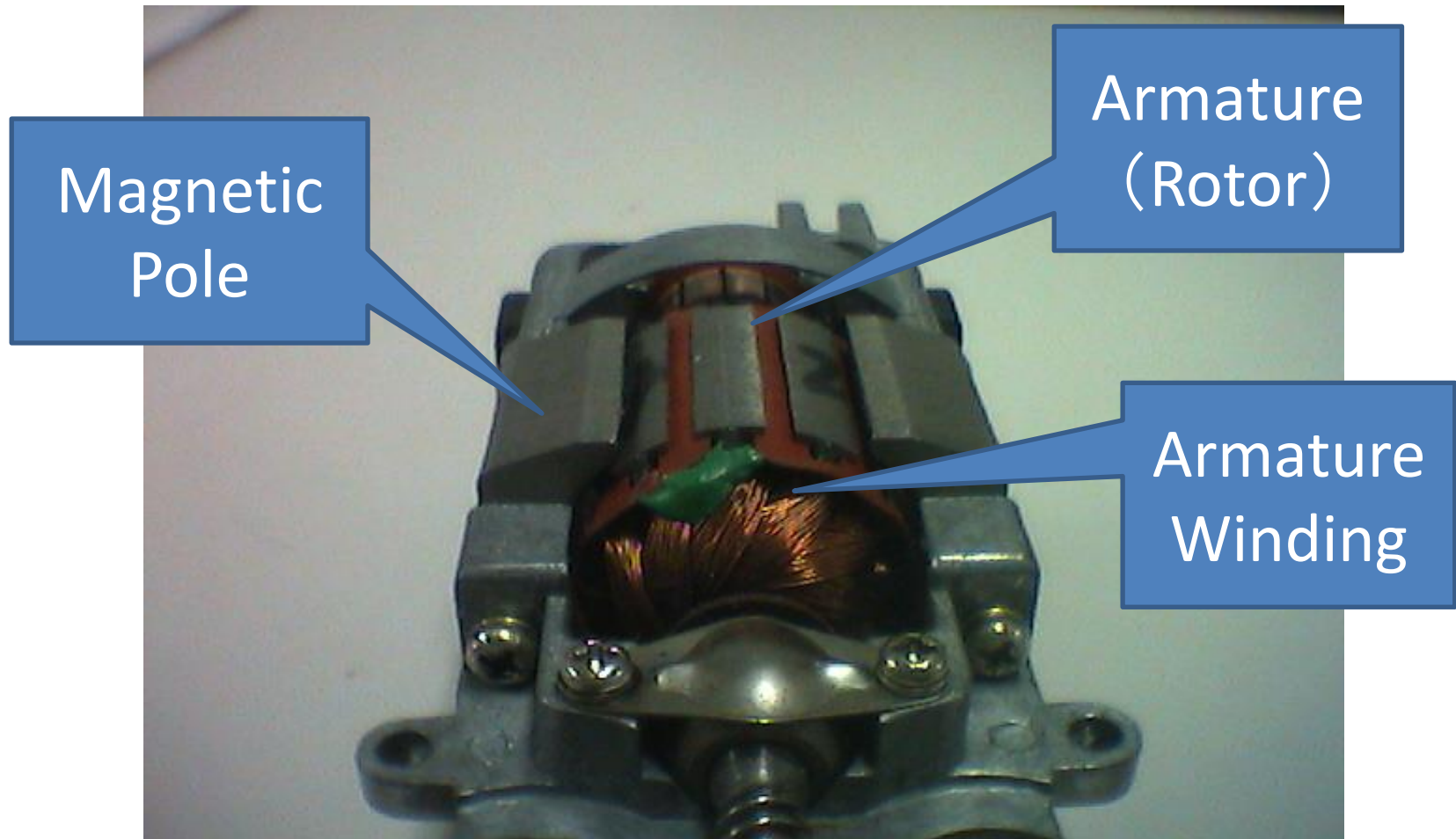
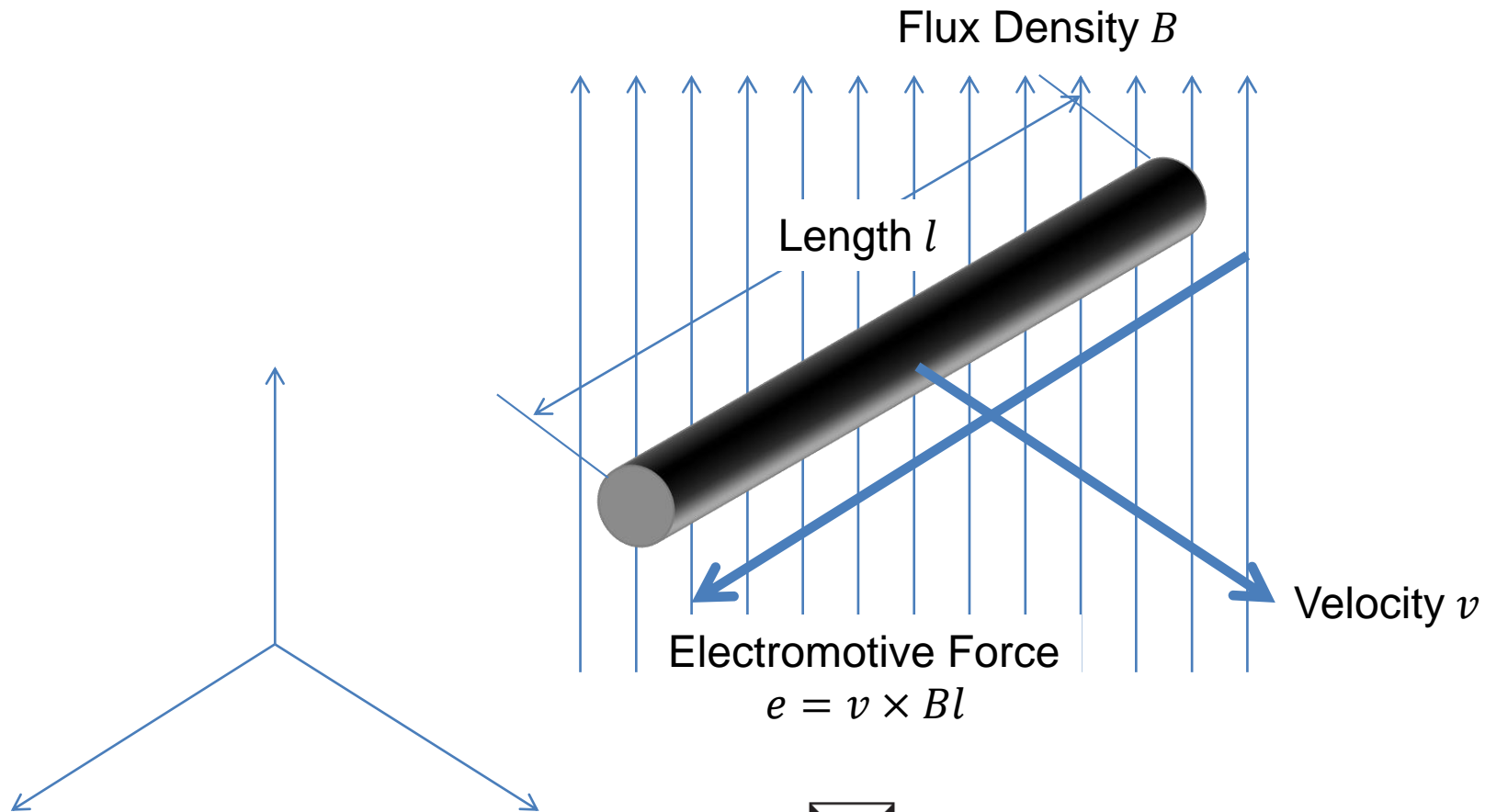Tokyo Institute of Technology

Contents of the Day

Contents of the Day:

- Electromagnetic induction
- Electromotive force
- Electromagnetic force and torque.

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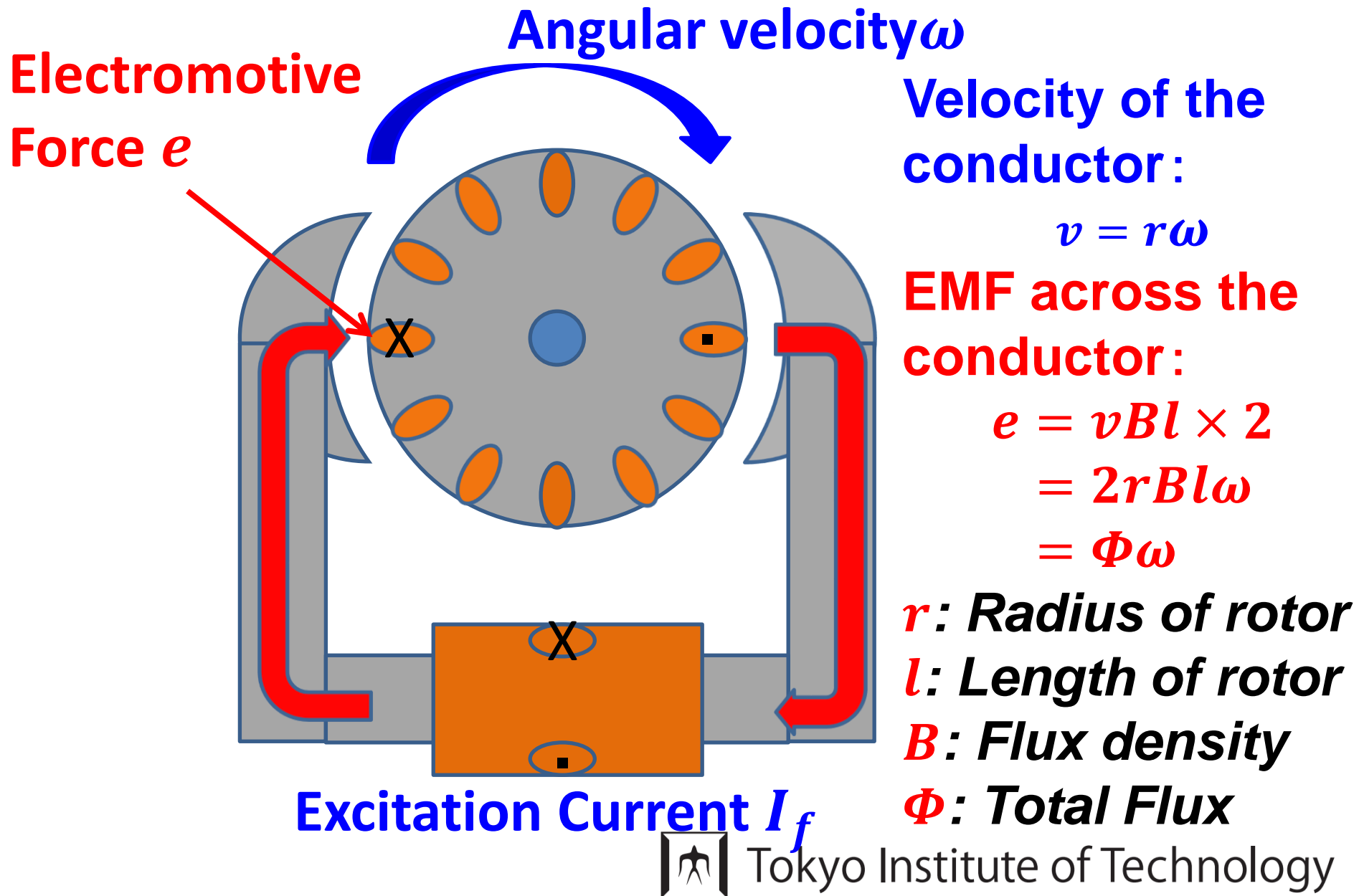
Rotor and Poles

Magnetic Pole

Armature（Rotor）

Armature Winding

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Fleming's Right Hand Rule

Flux Density B

Length l

Electromotive Force
$e = v \times Bl$

Velocity v

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Electromotive Force

Angular velocity ω

Electromotive Force e

Velocity of the conductor：

$$v = r\omega$$

EMF across the conductor：

$$e = vBl \times 2$$
$$= 2rBl\omega$$
$$= \Phi\omega$$

r : Radius of rotor
l : Length of rotor
B : Flux density
Φ : Total Flux

Excitation Current I_f

To be Continued in the Lecture…..

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