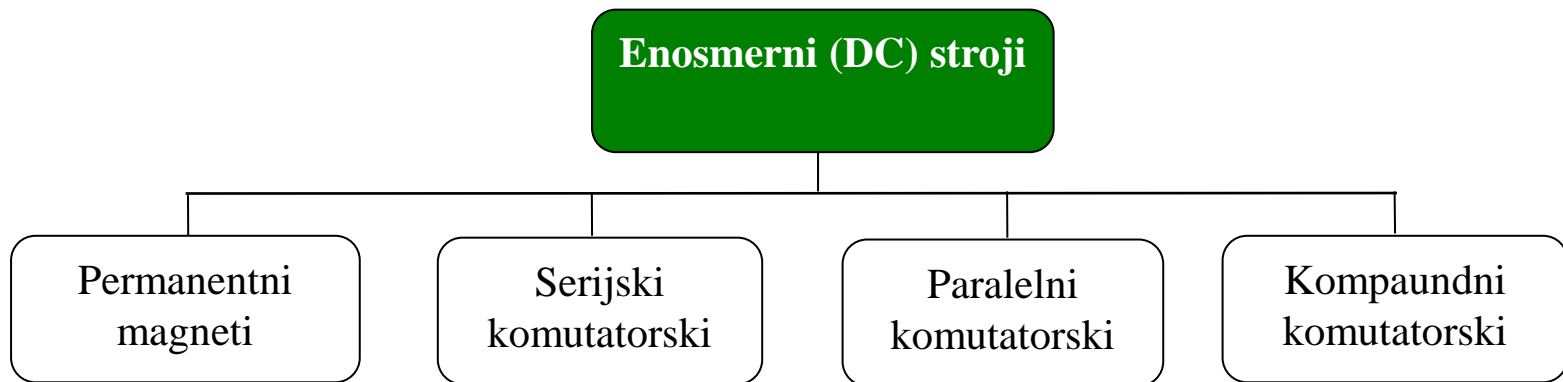


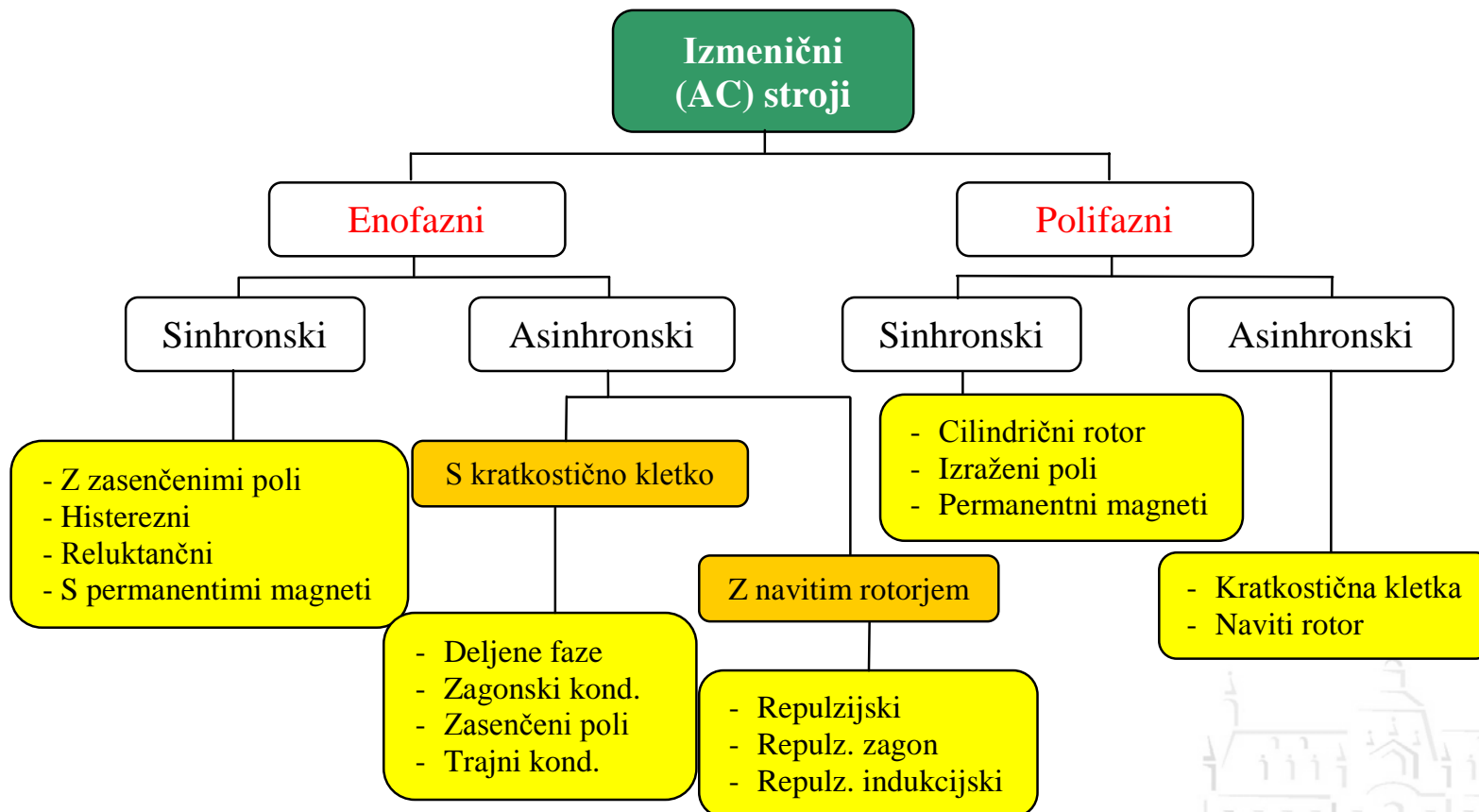


## Enosmerni motorji



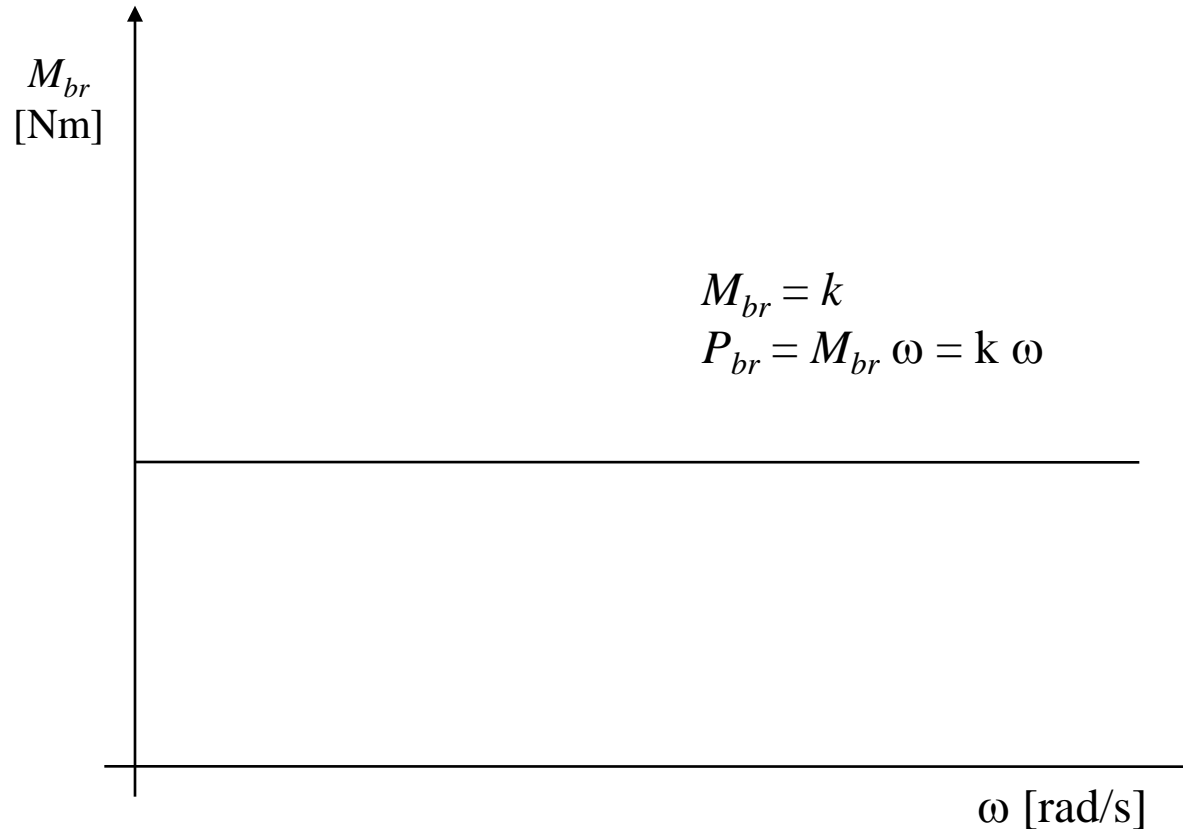


## Izmenični motorji





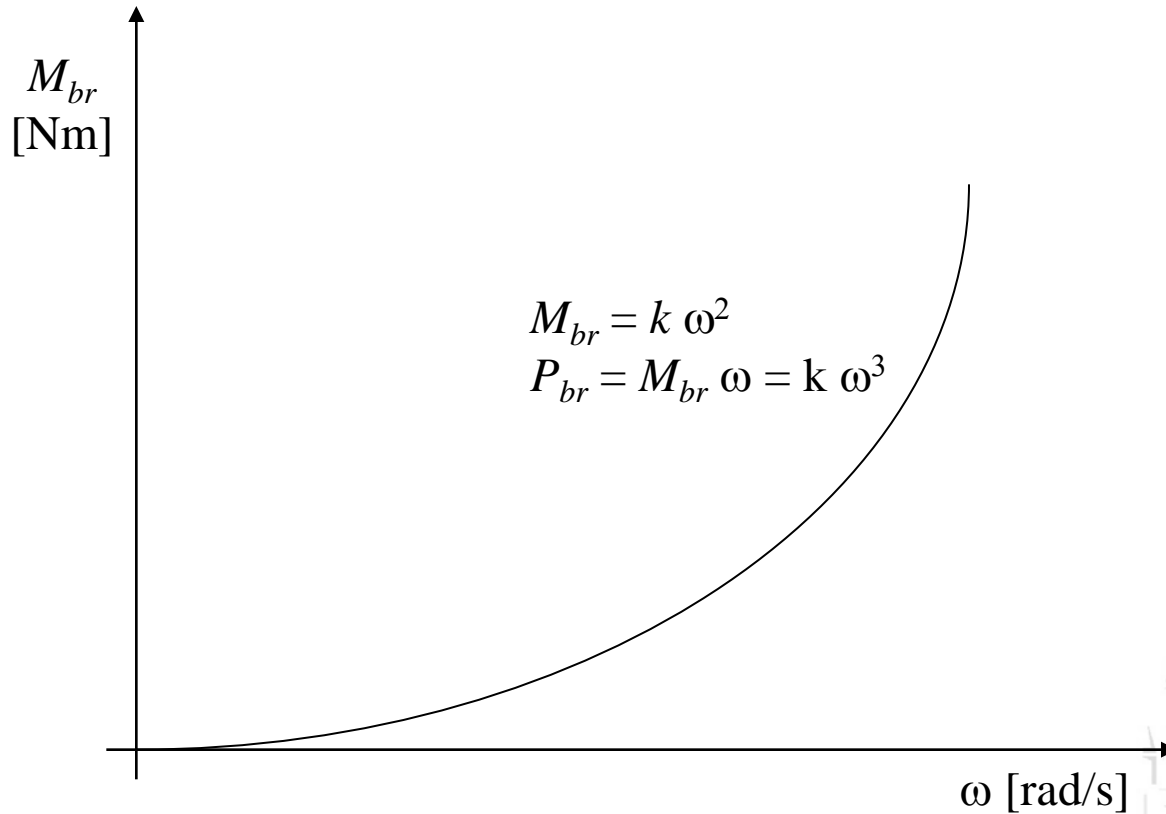
## Značilne navorne karakteristike **bremen**



Delovni stroji, ki opravljajo dela dviganja, trenja ali preoblikovanja: dvigala, vozila z majhno hitrostjo, obdelovalni stroji, transportni trakovi, industrijski pogoni z valji.



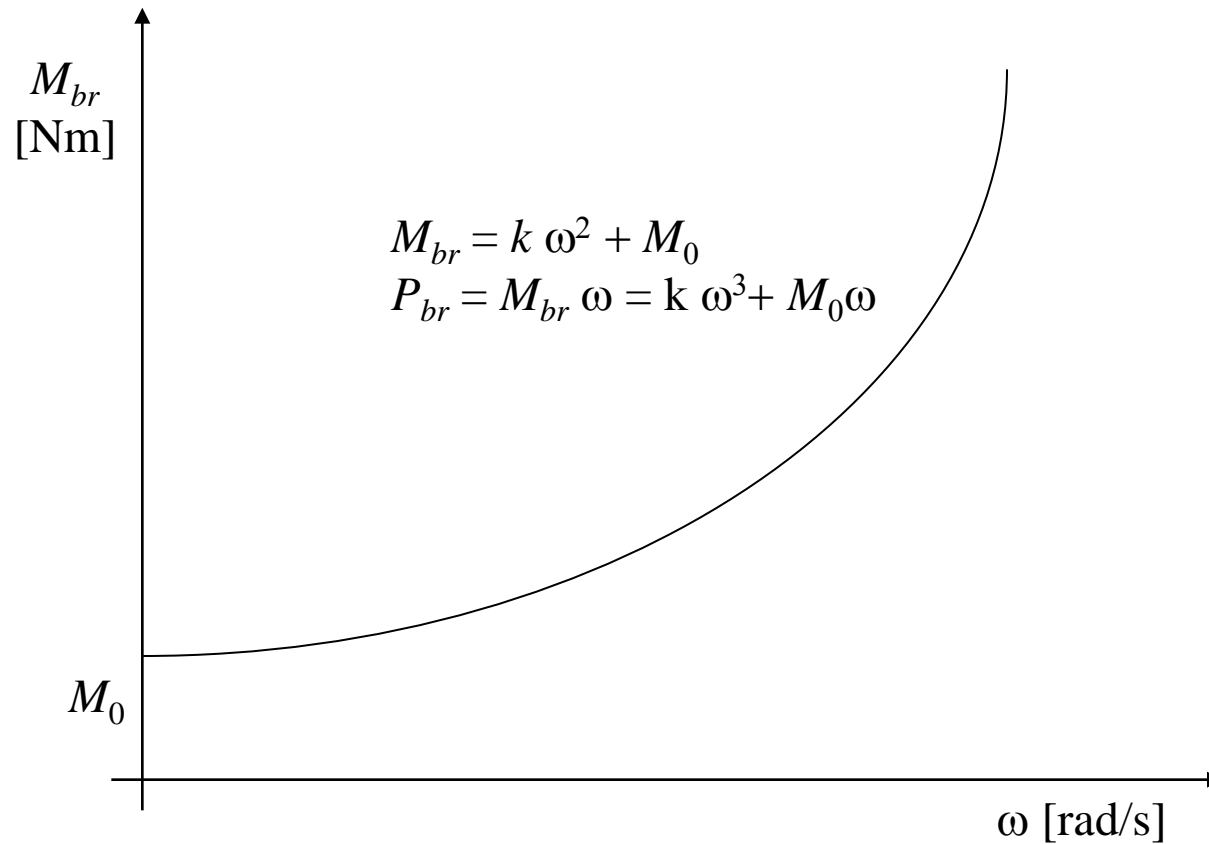
## Značilne navorne karakteristike **bremen**



Zračni ali tekočinski upor: ventilatorji, centrifugalne črpalke, mešalniki, ladijski vijaki.



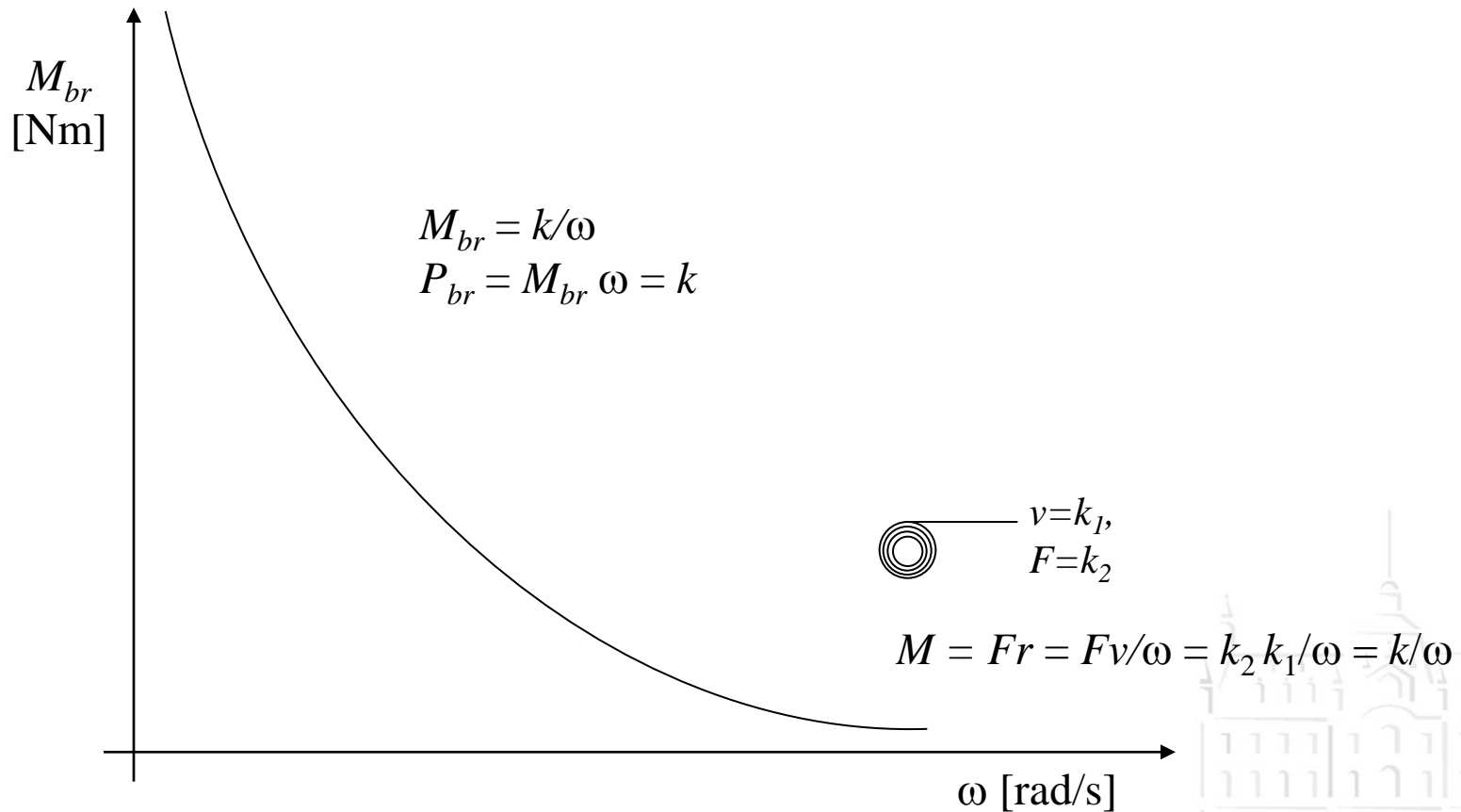
## Značilne navorne karakteristike **bremen**



Trenje + zračni upor: tirna vozila, cestna vozila, transportne naprave.



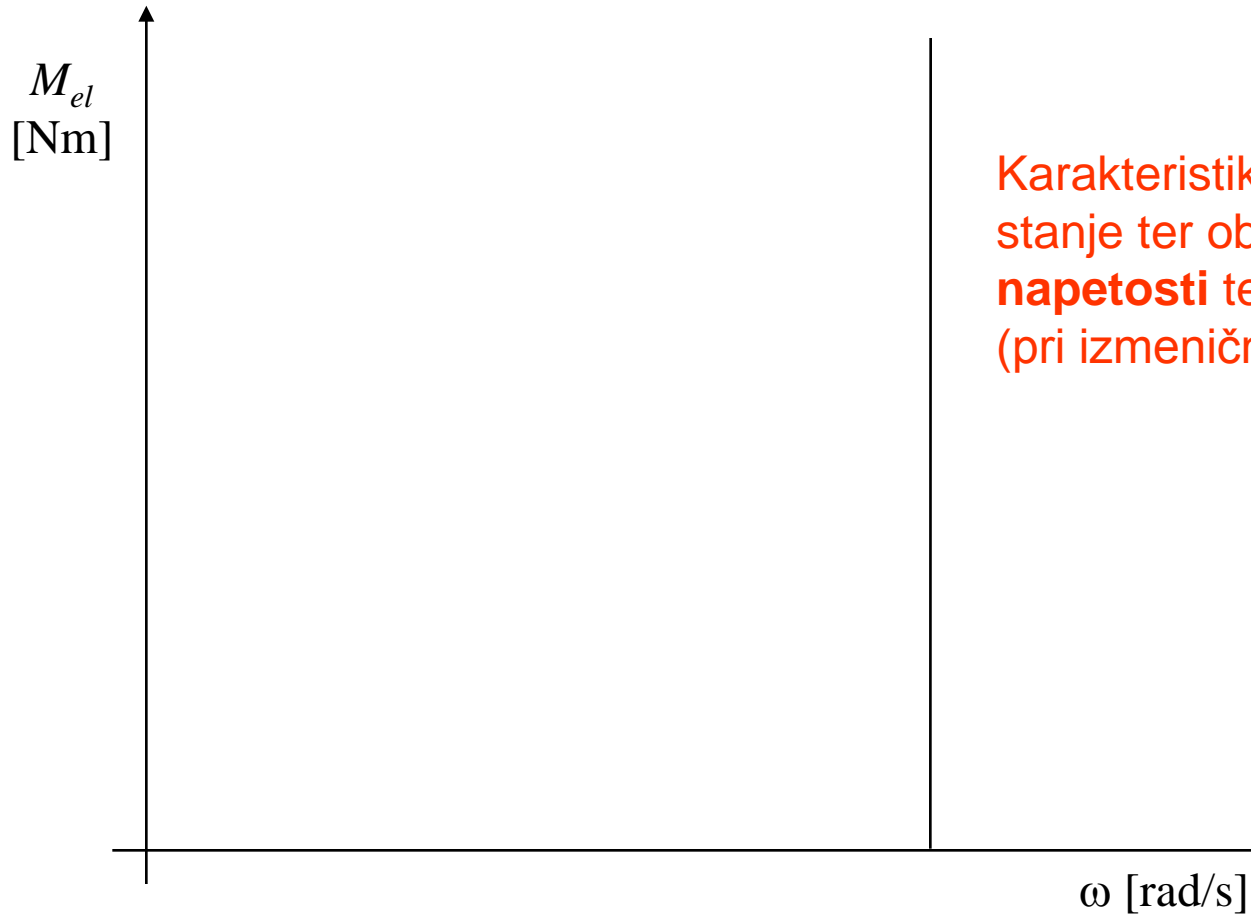
## Značilne navorne karakteristike **bremen**



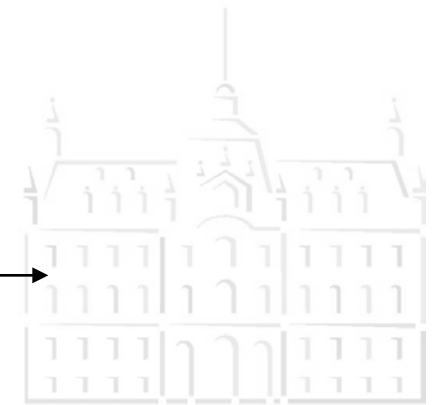
Navijalni stroji: navijanje papirja, tekstila, pločevine.



## Značilne navorne karakteristike **električnih motorjev**

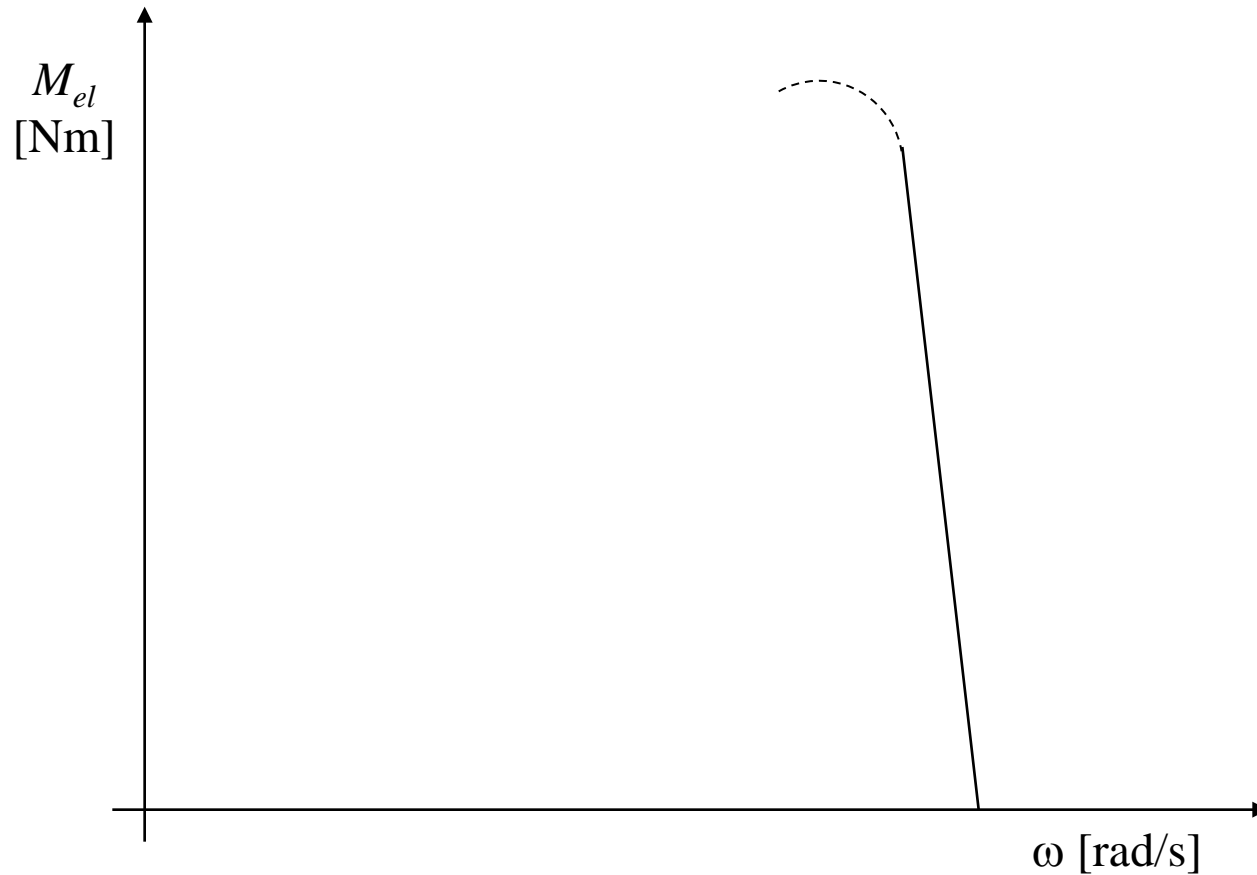


Sinhronska karakteristika: sinhronski stroji.





## Značilne navorne karakteristike **električnih motorjev**

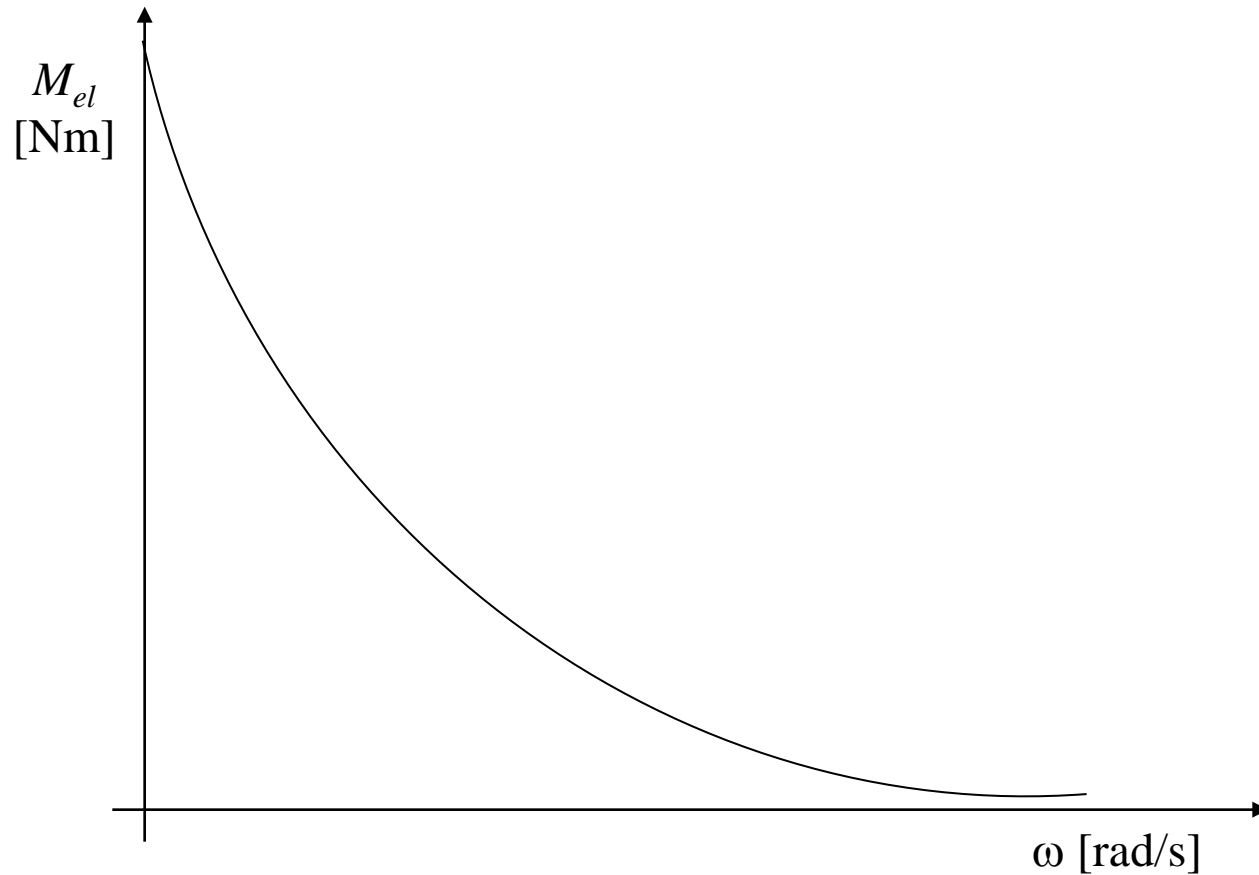


Trda karakteristika: asinhronski stroji, komutatorski stroji z vzporednim vzbujanjem





## Značilne navorne karakteristike **električnih motorjev**



Mehka karakteristika: komutatorski stroji z zaporednim vzbujanjem



Dinamično stanje ( $\omega = \text{var.} \rightarrow \alpha \neq 0, M_d \neq 0$ )

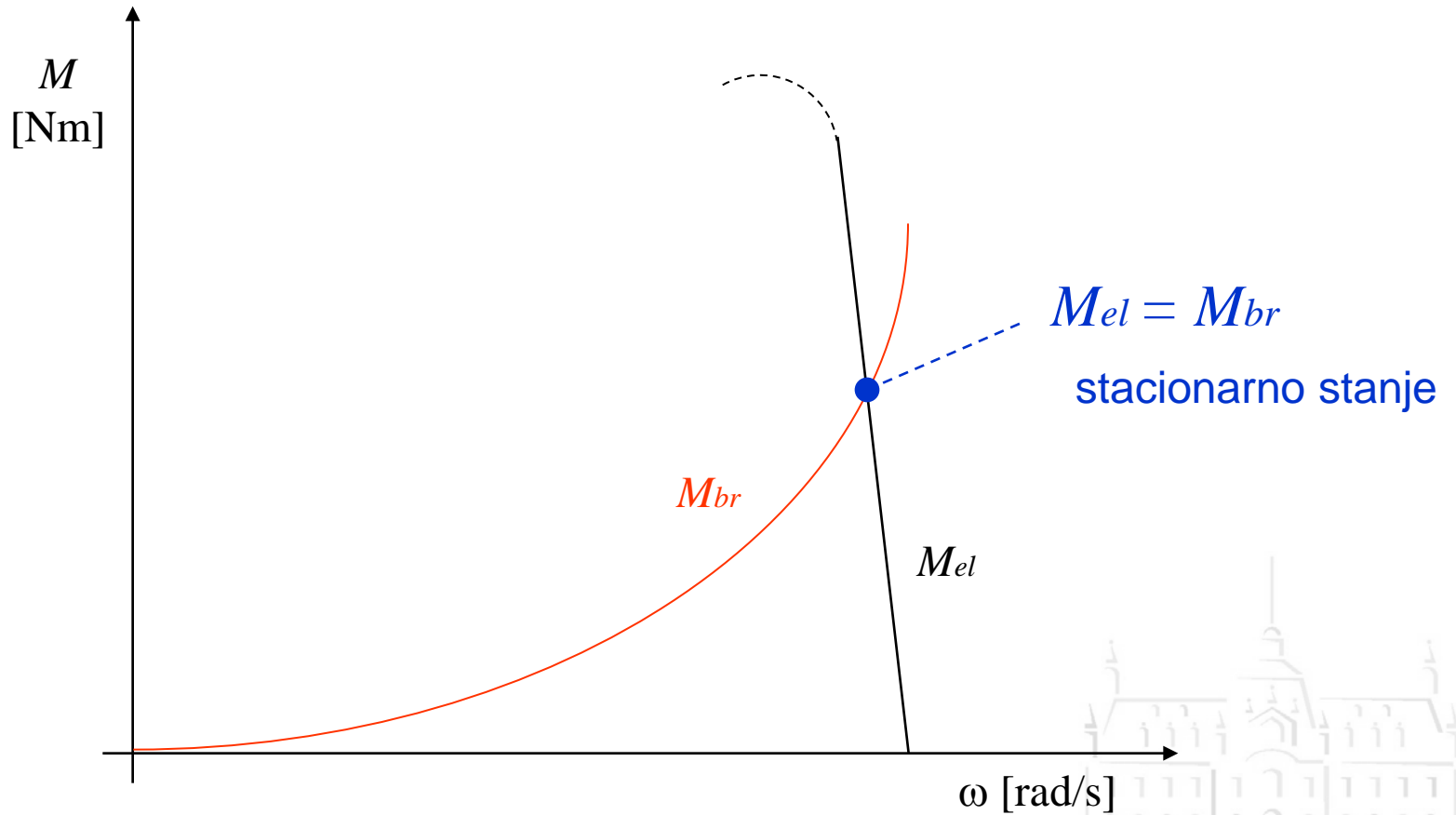
$$M_{el} = M_{br} + \underbrace{M_d}_{J \frac{d\omega}{dt}}$$

$$\left( M_d = J\alpha = J \frac{d\omega}{dt} = J \frac{d^2\varepsilon}{dt^2} \right)$$

Stacionarno stanje ( $\omega = \text{const.}$   $\rightarrow \alpha = 0, M_d = 0$ )

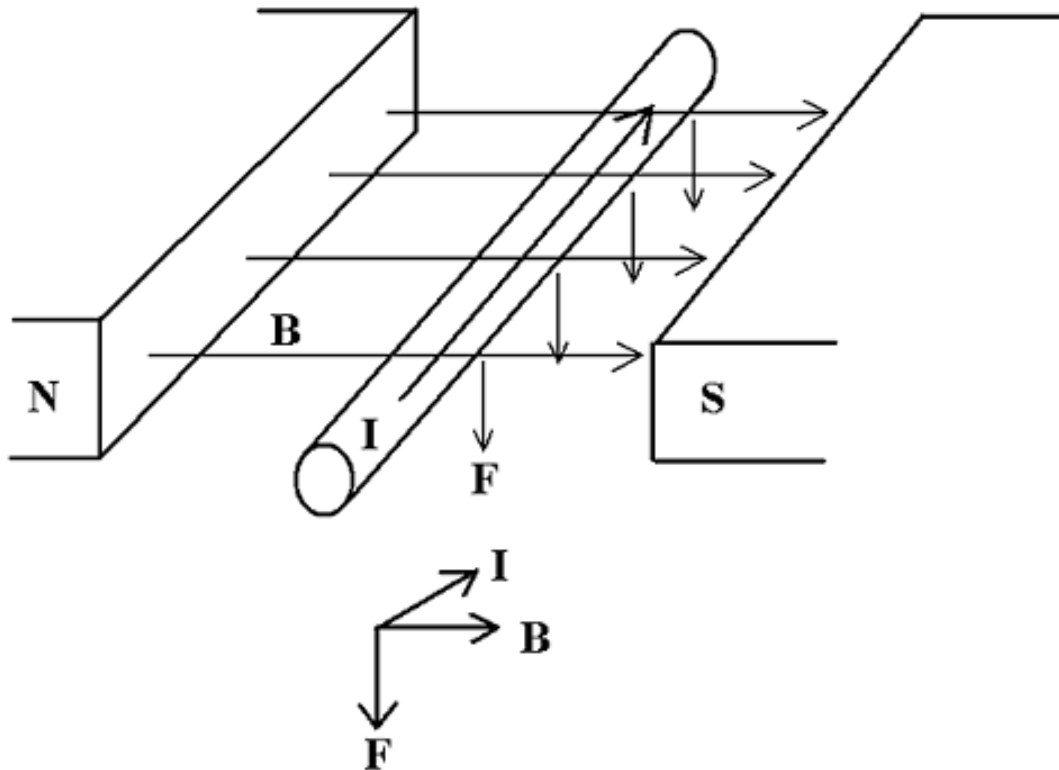
$$M_{el} = M_{br}$$





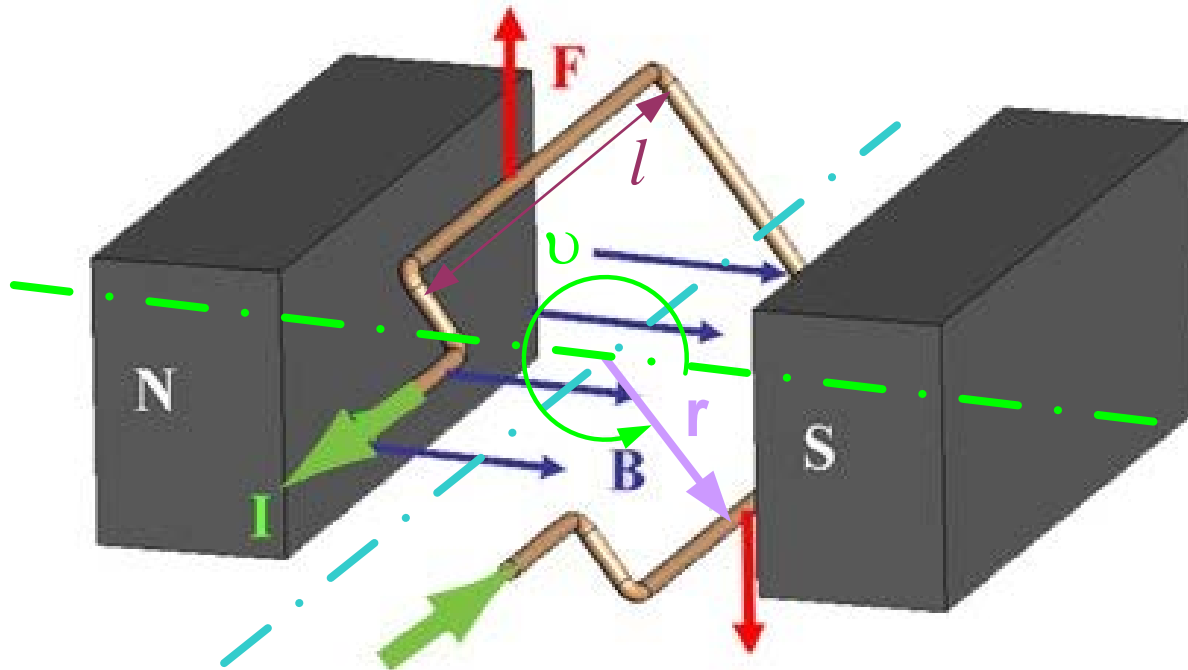


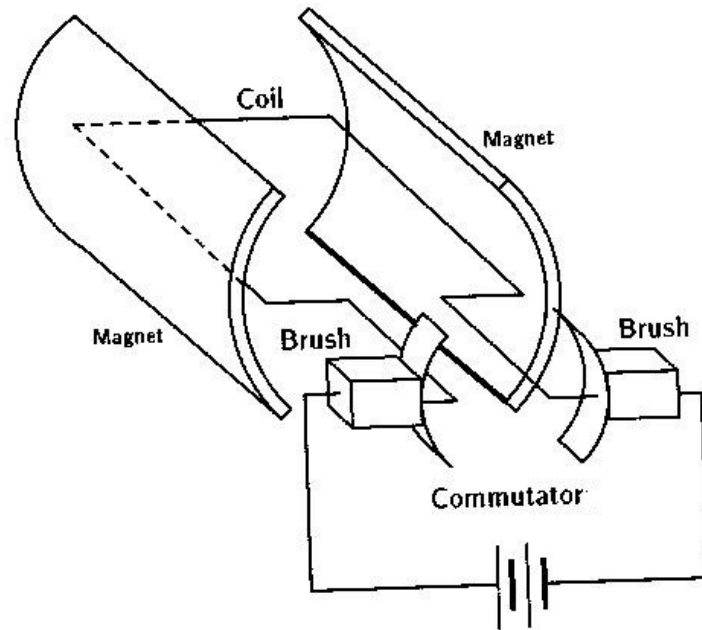
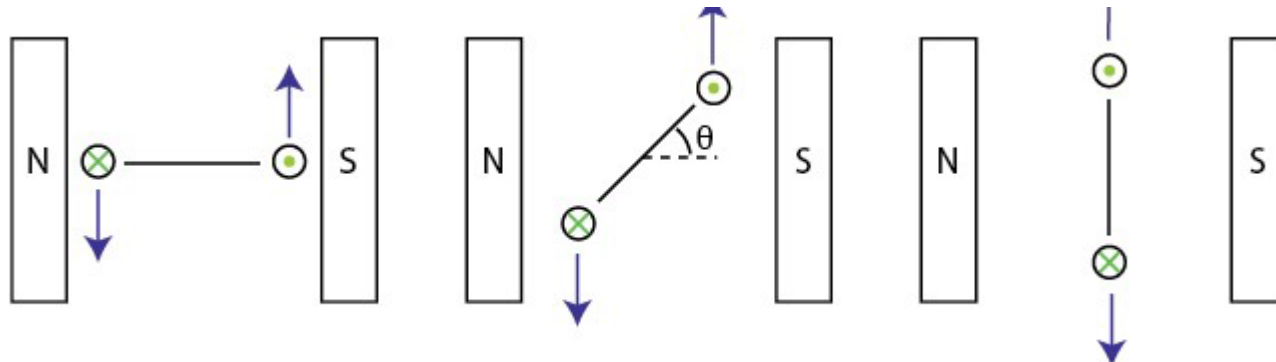
$$\vec{F} = (\vec{l} \times \vec{B}) i$$

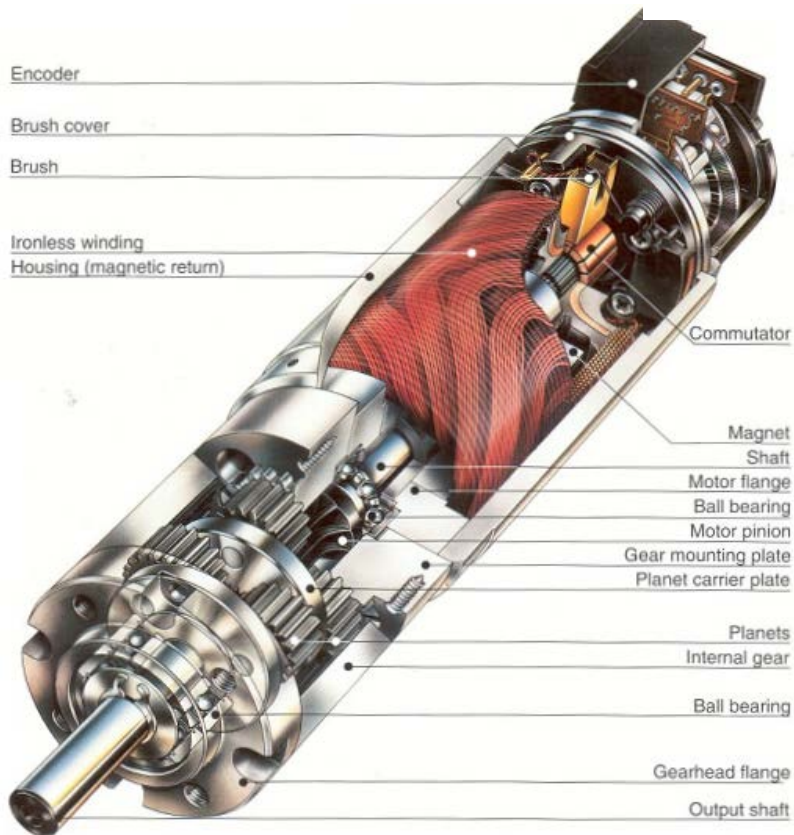
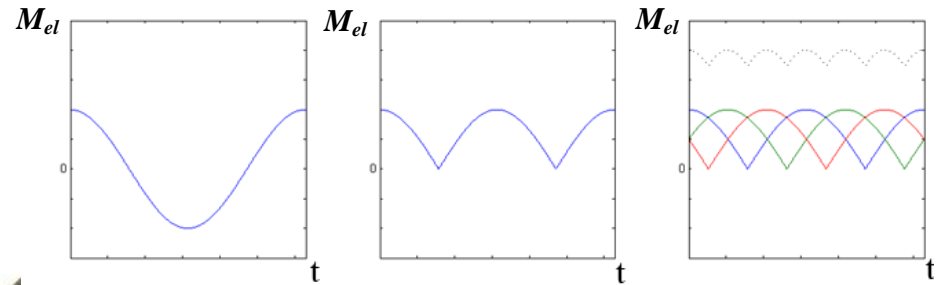


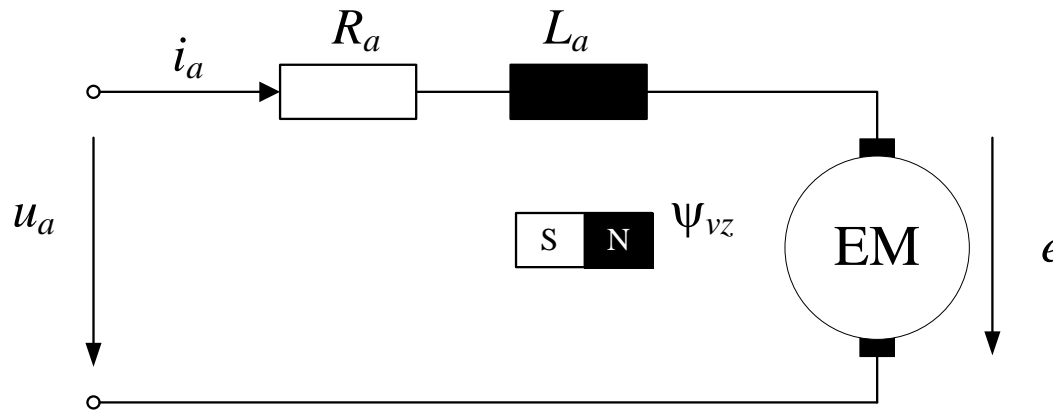


$$\begin{aligned} \vec{M}_{el} &= 2 \cdot (\vec{r} \times \vec{F}) = 2 \cdot (\vec{r} \times ((\vec{l} \times \vec{B})i)) = 2 \cdot (\vec{l}(\vec{r} \cdot \vec{B}) - \underbrace{\vec{B}(\vec{r} \cdot \vec{l})}_0)i = \\ &= 2(\vec{l}(rB \cos \theta))i = 2\vec{l}_{en}l \left( r \frac{\Phi}{A} \right) i \cos \theta = 2\vec{l}_{en}l \left( r \frac{\Phi}{2rl} \right) i \cos \nu = \vec{l}_{en} \Phi i \cos \theta. \end{aligned}$$









$$u_a = R_a i_a + L_a \frac{di_a}{dt} + e$$

$$e = k_e \psi_{vz} \omega$$

$$M_{el} = k_M \psi_{vz} i_a$$

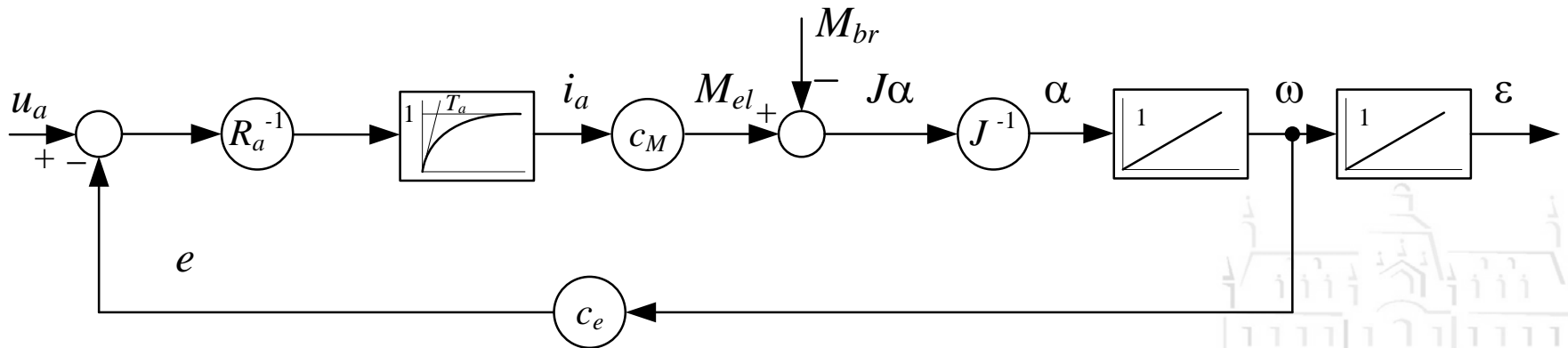
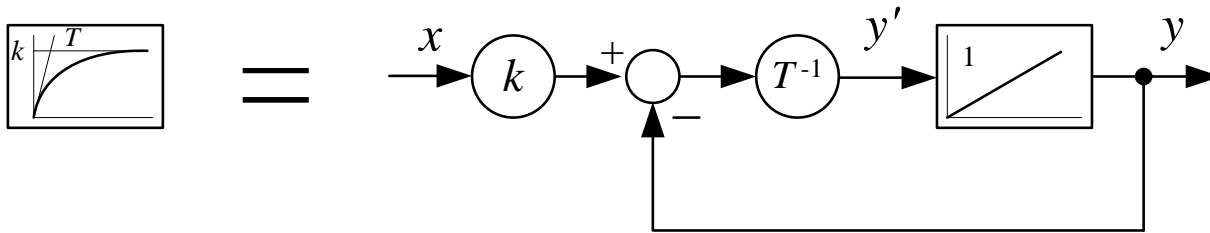
$$J \frac{d\omega}{dt} = M_{el} - M_{br}$$

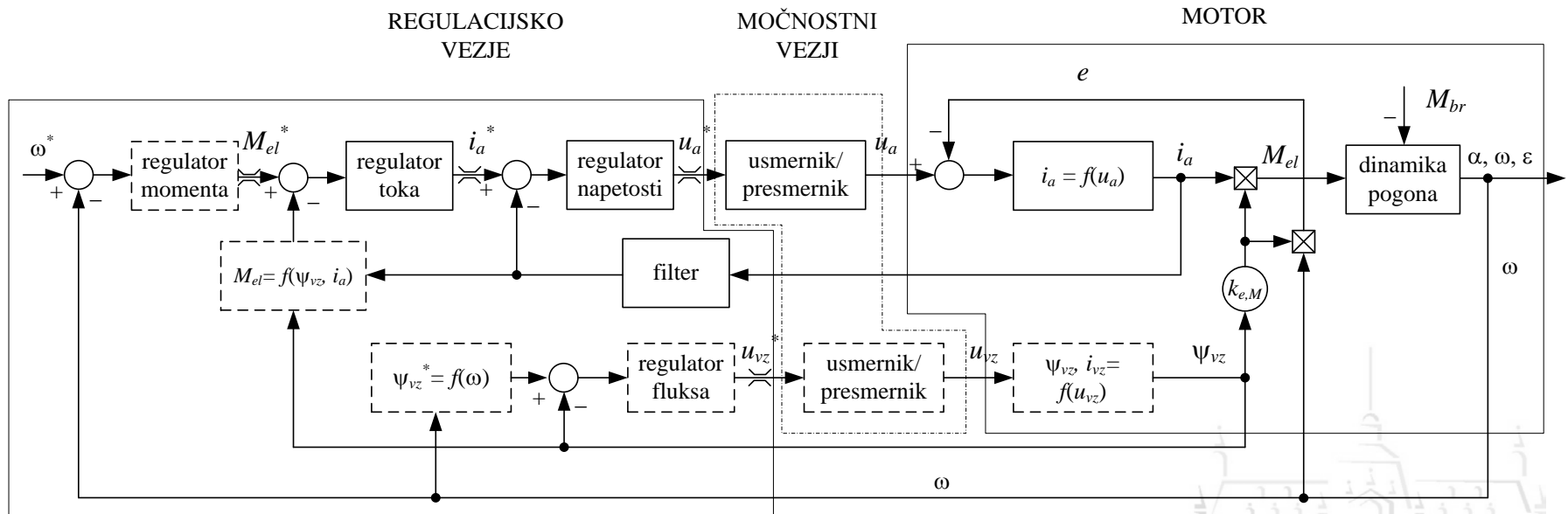


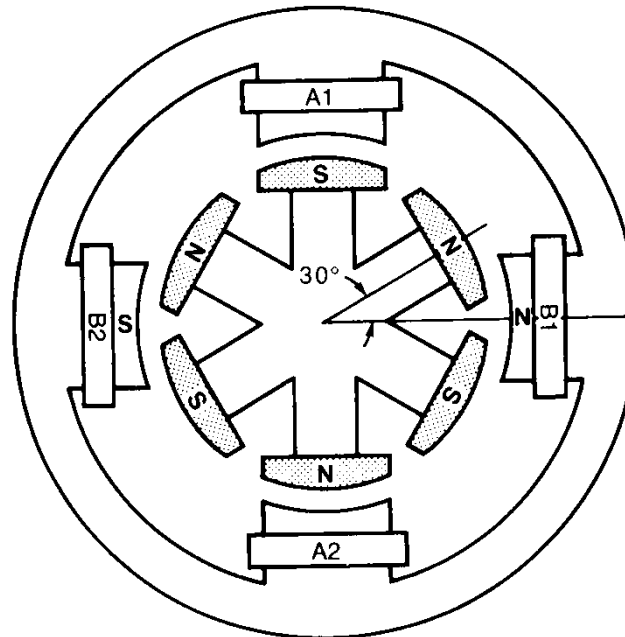




$$T \frac{dy(t)}{dt} + y(t) = k \cdot x(t)$$







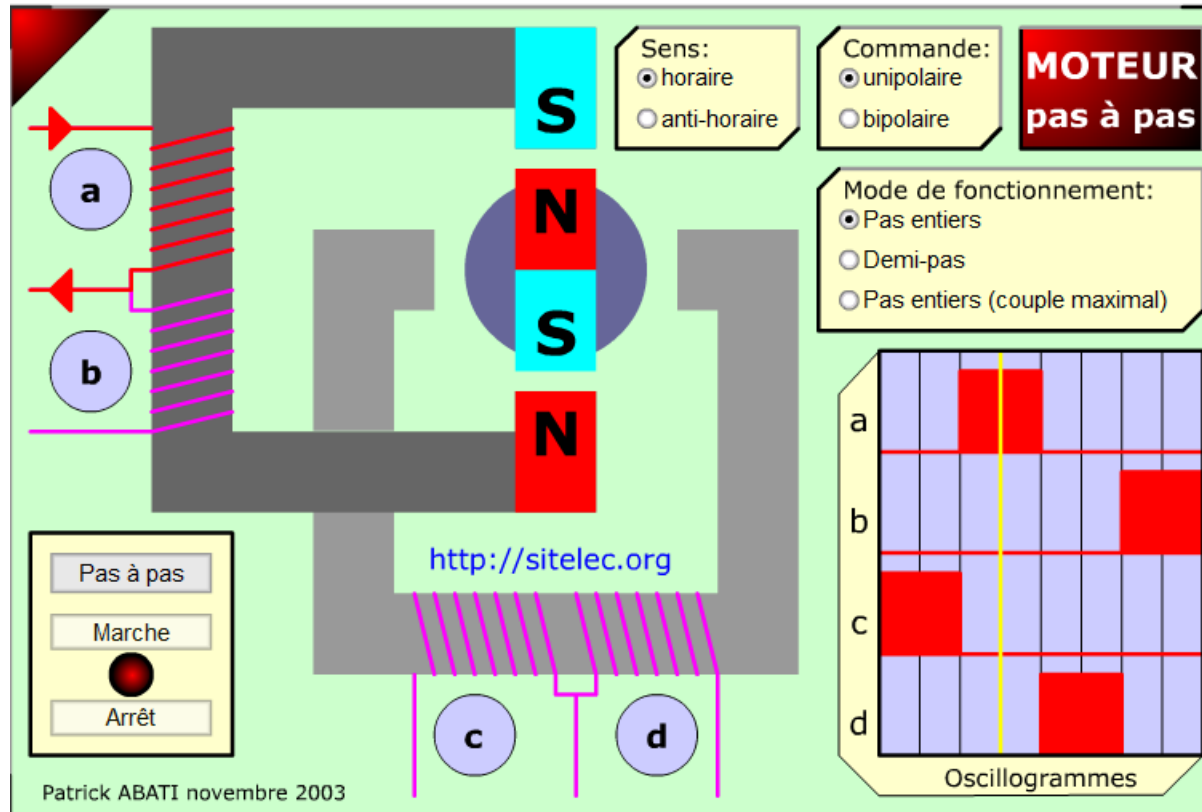
- Trajni magnet na rotorju
- Navitja (lahko različno število, npr. 3) na statorju
- Navitja napajamo z bipolarnimi enosmernimi napetostmi (pošiljamo tokove)





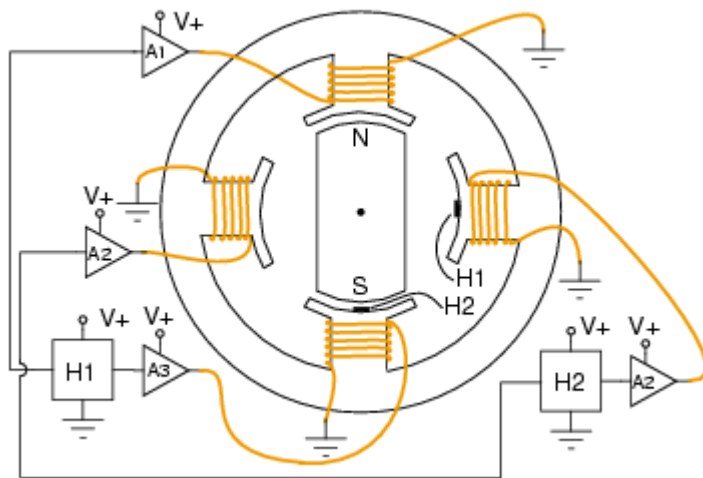


## Koračni motorji



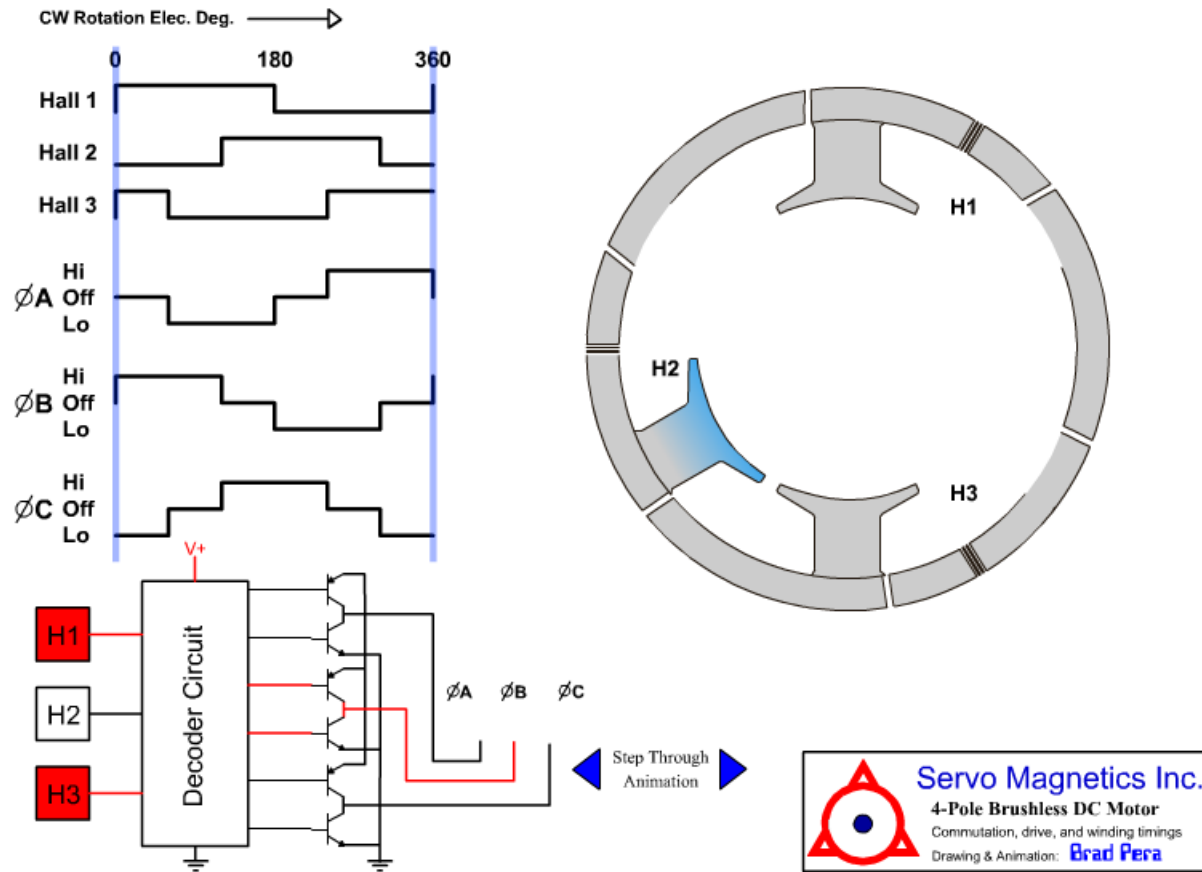


## Brezkrtačni enosmerni motor (BLDC)



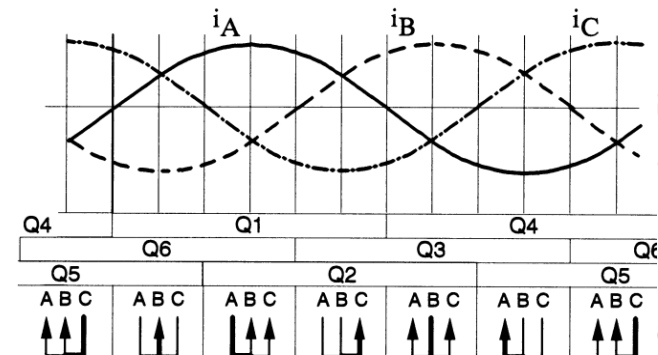
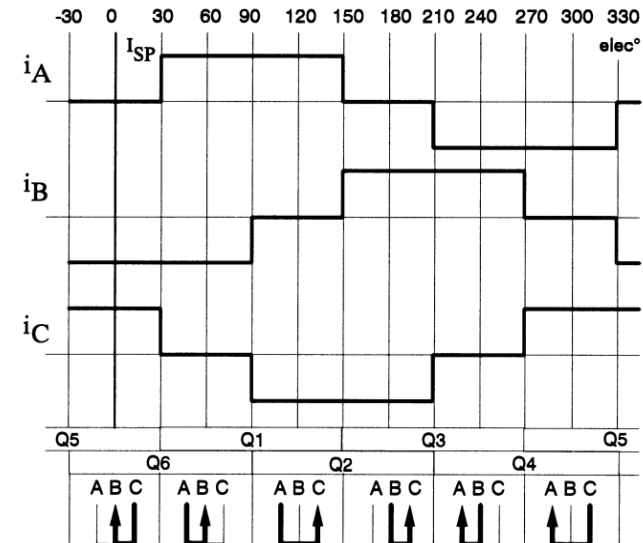
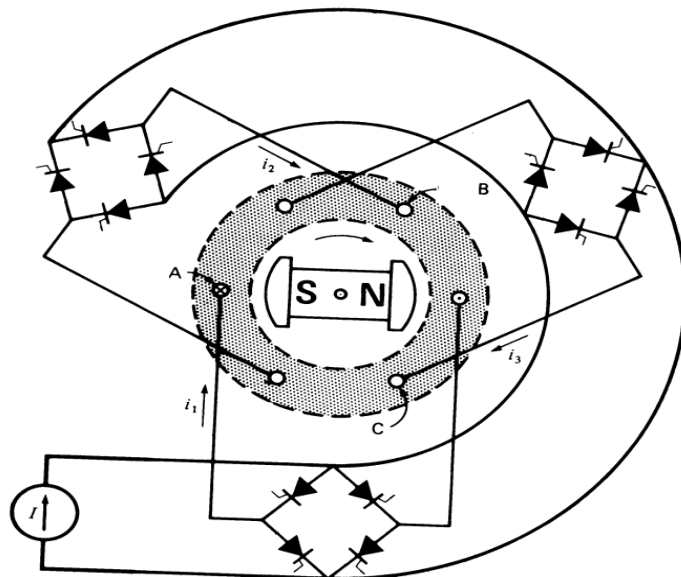
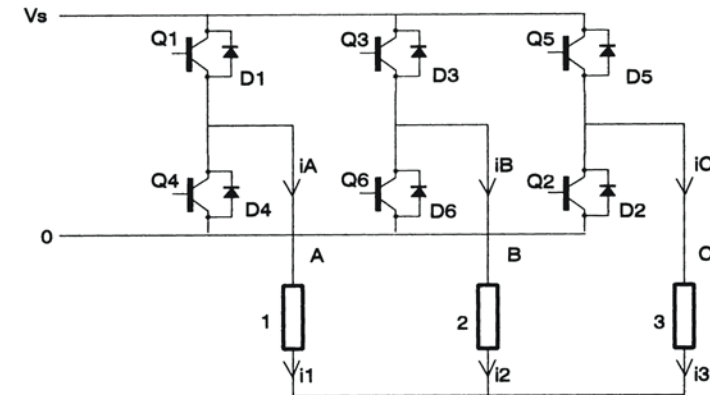


## Brezkrtačni enosmerni motor (BLDC)





## Brezkrtačni enosmerni in izmenični motor (BLDC in BLAC)







# Asinhronski motorji

