

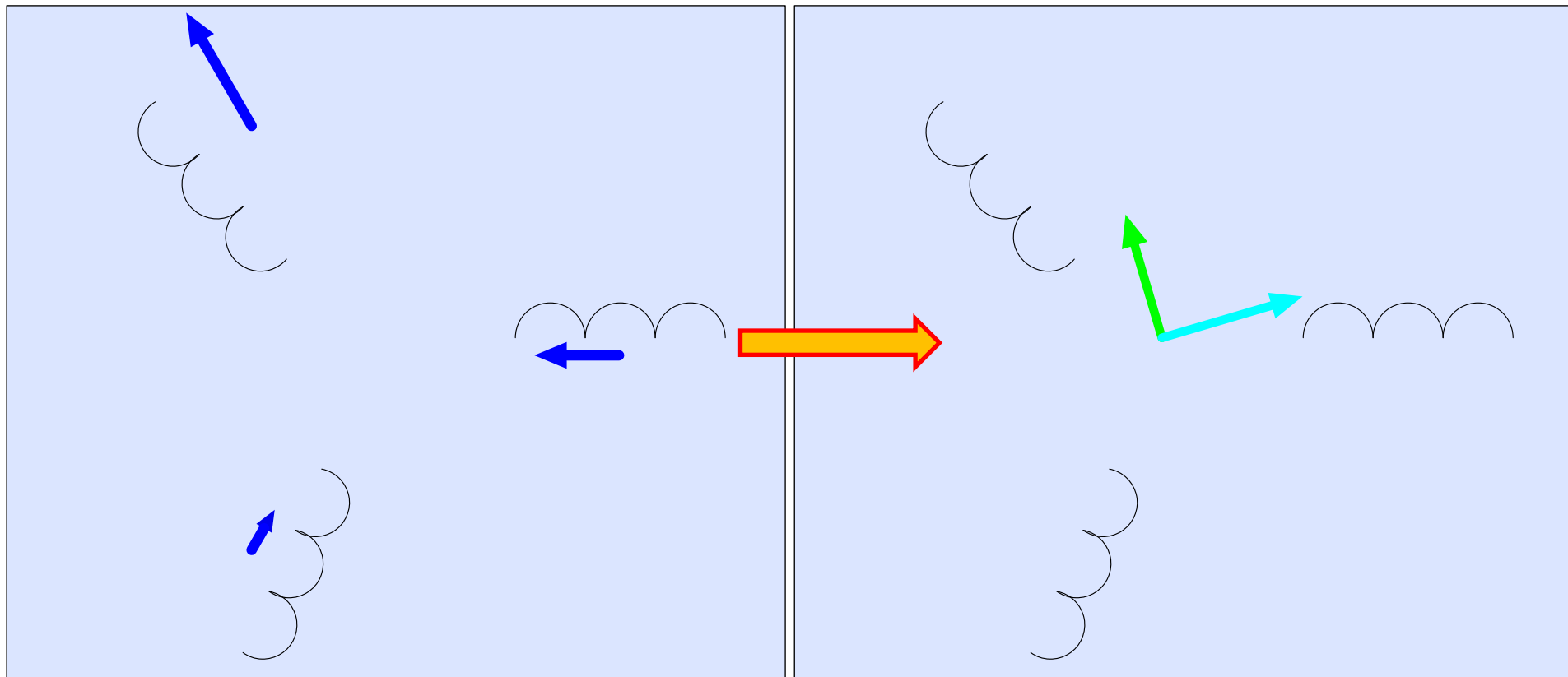
Vizualizace transformace souřadného systému *a-b-c* do *d-q-0* a zpět, alias Parkovy transformace

2021

Doc. Ing. Karel Noháč, Ph.D.

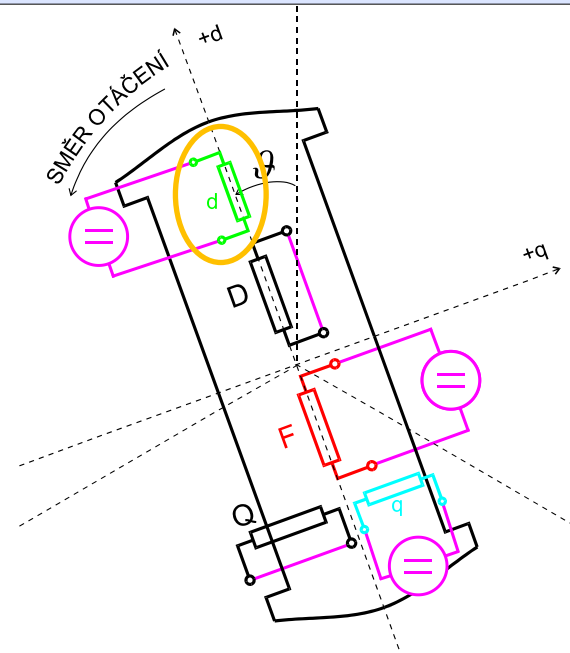
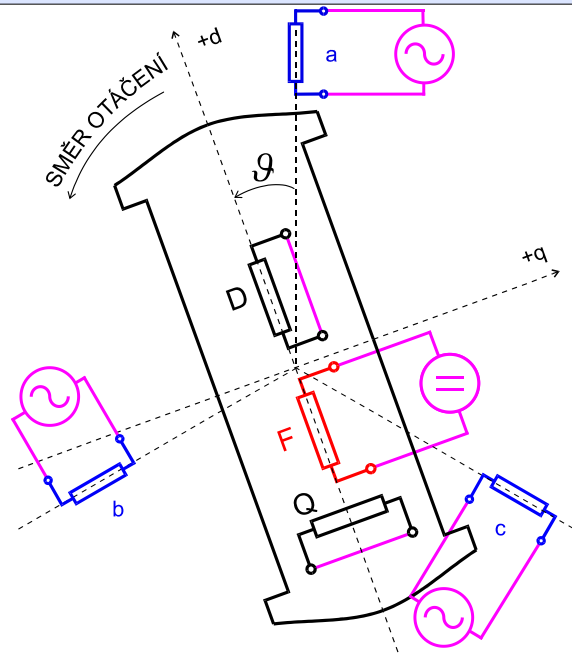
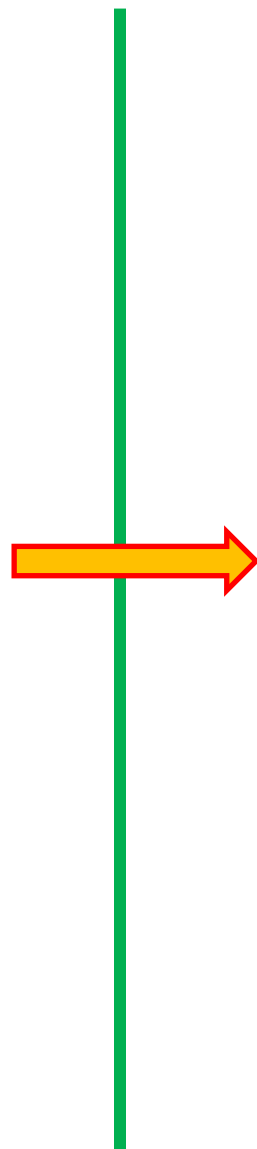
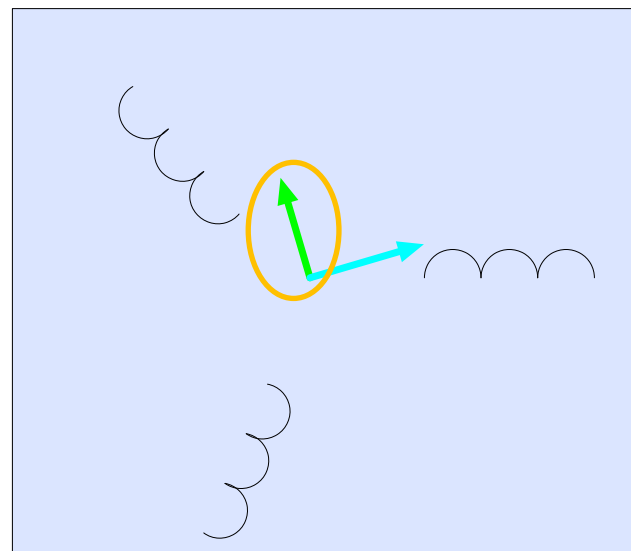
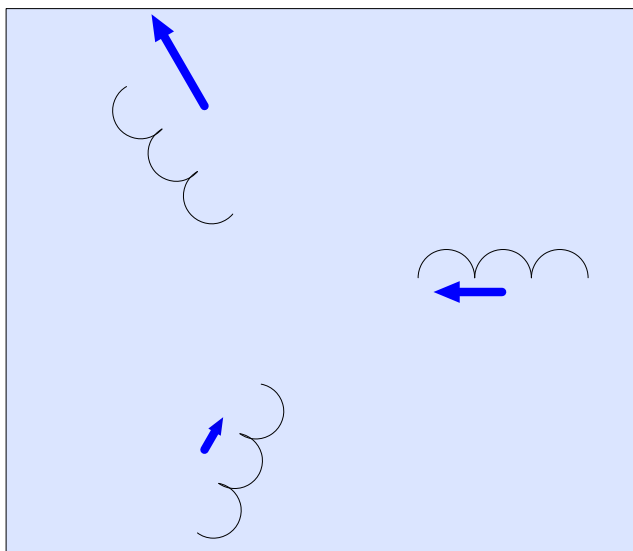
Parkova transformace

Parkova transformace je převedení statorových veličin do souřadného systému pevně spojeného s rotorem, přičemž osa d je ve směru budícího toku a osa q v pozici mezipólové.



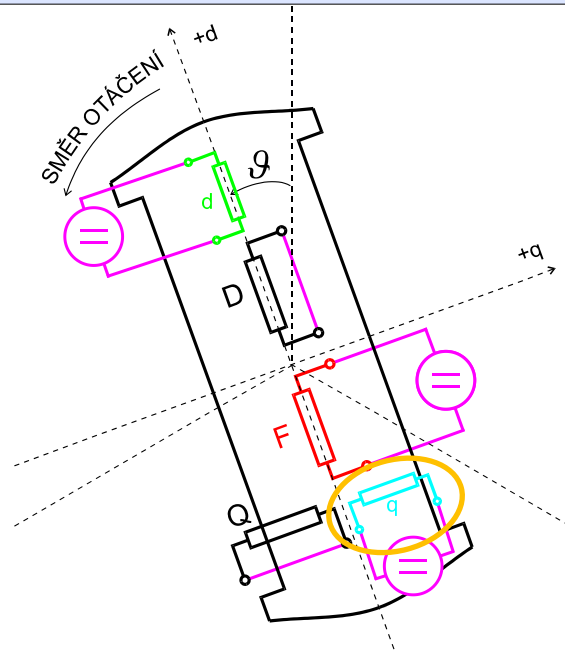
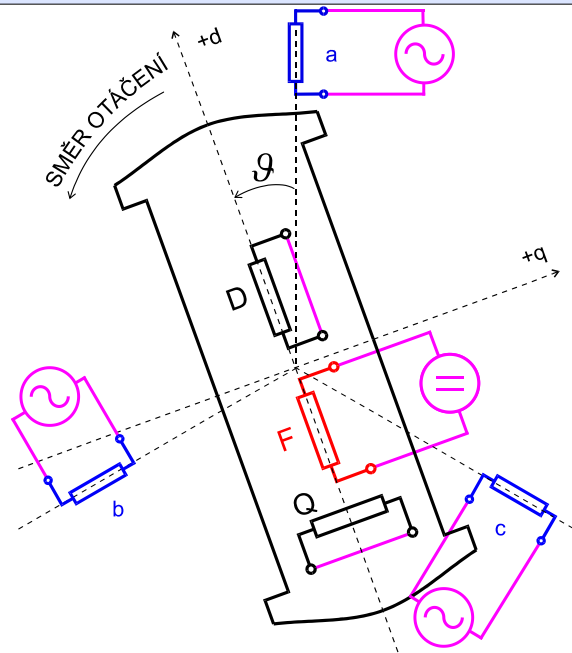
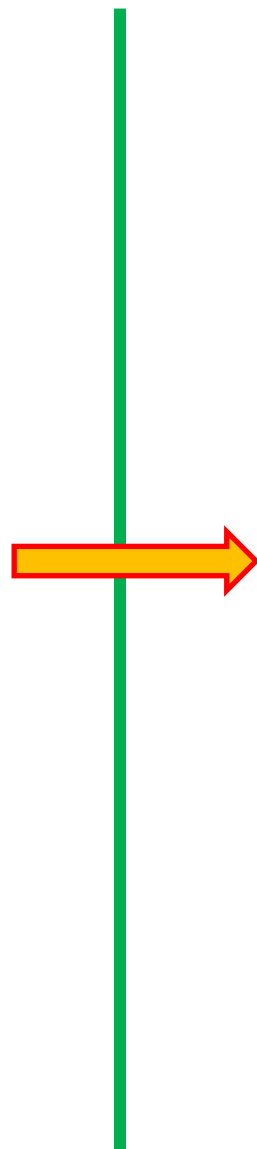
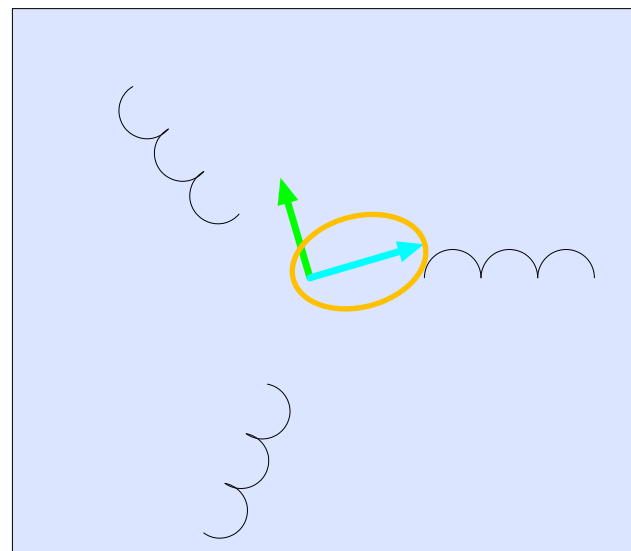
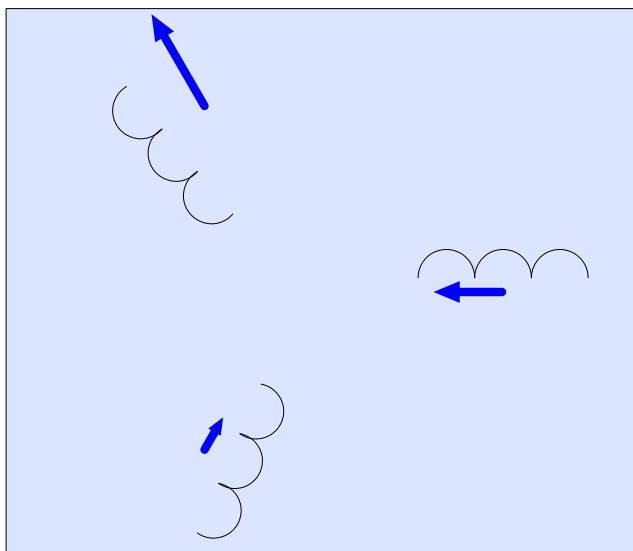
Magnetické toky v jednotlivých vinutích

Jednoduché náhradní schéma synchronního stroje v $a-b-c$ a $d-q-0$



Magnetické toky v jednotlivých vinutích

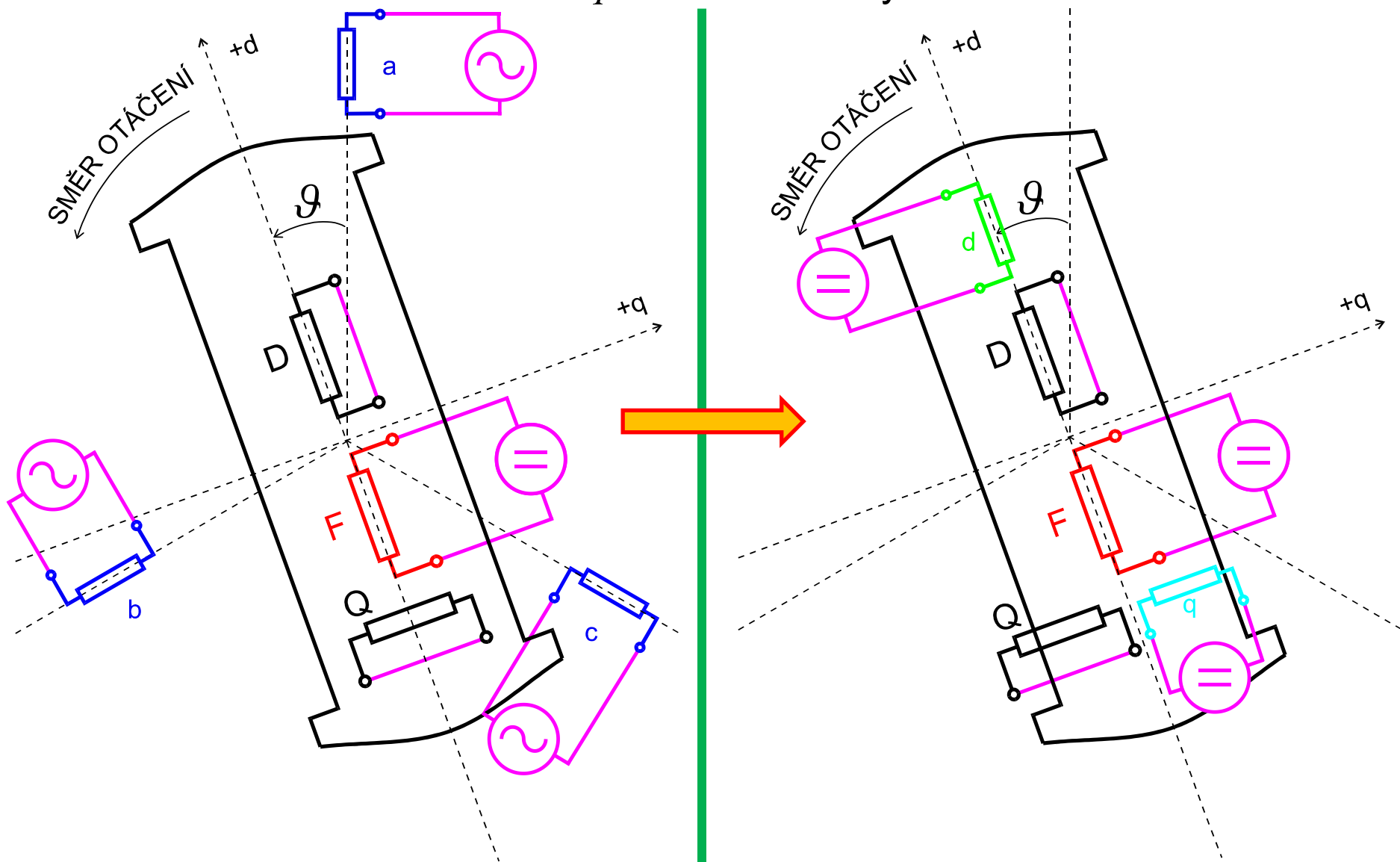
Jednoduché náhradní schéma synchronního stroje v $a-b-c$ a $d-q-0$



Magnetické toky v jednotlivých vinutích

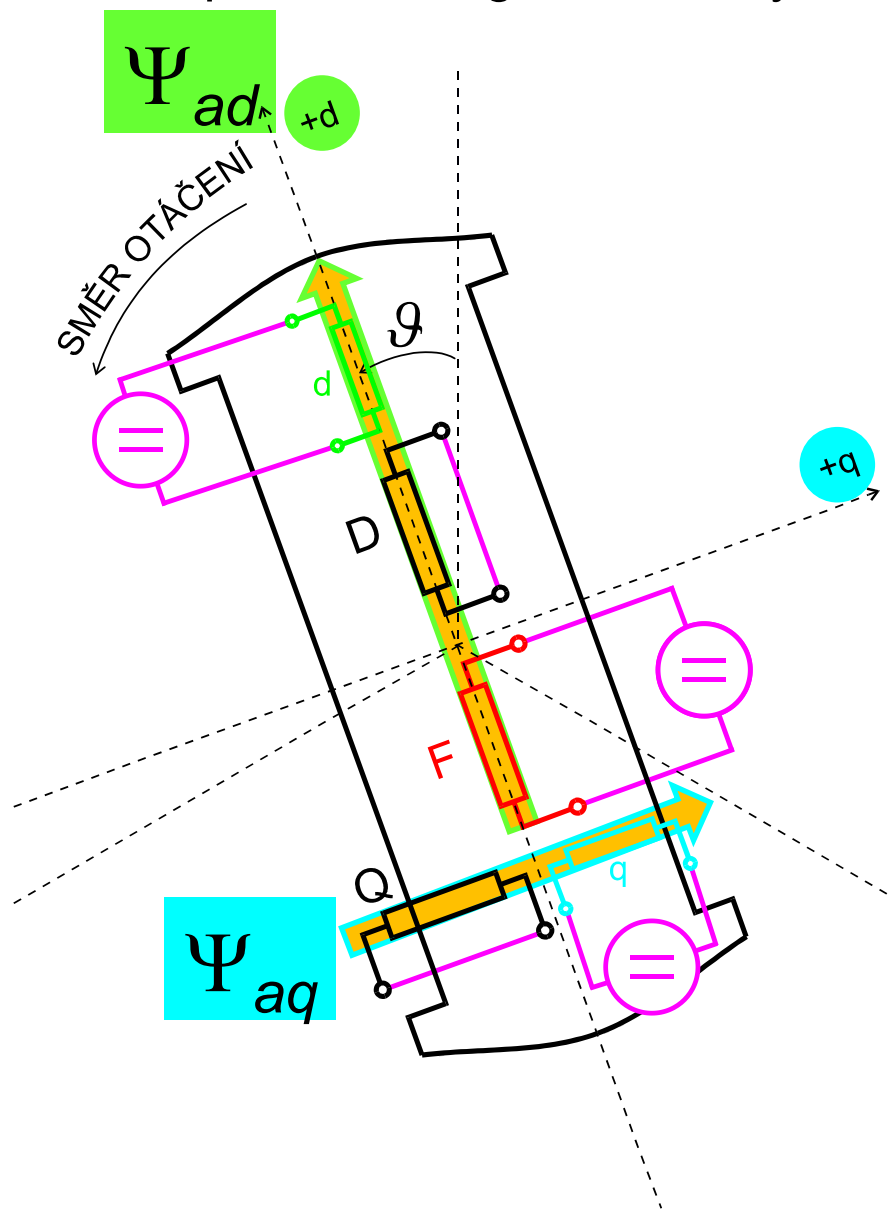
Jednoduché náhradní schéma synchronního stroje

v $a-b-c$ a $d-q-0$ souřadném systému



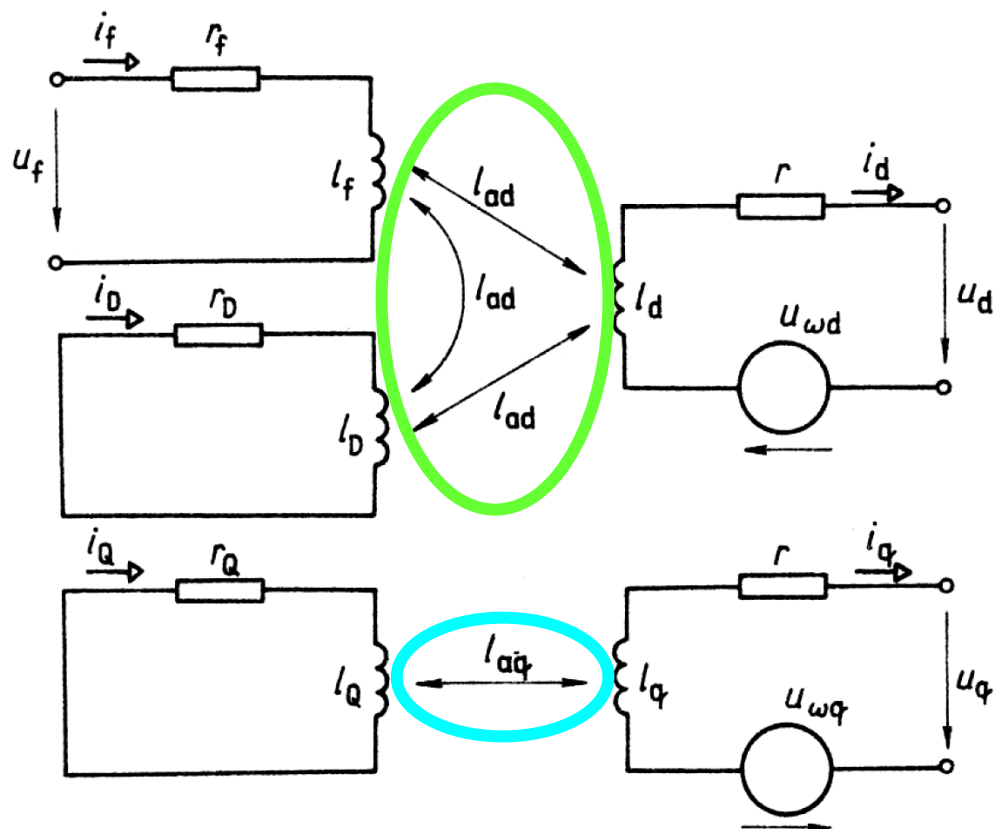
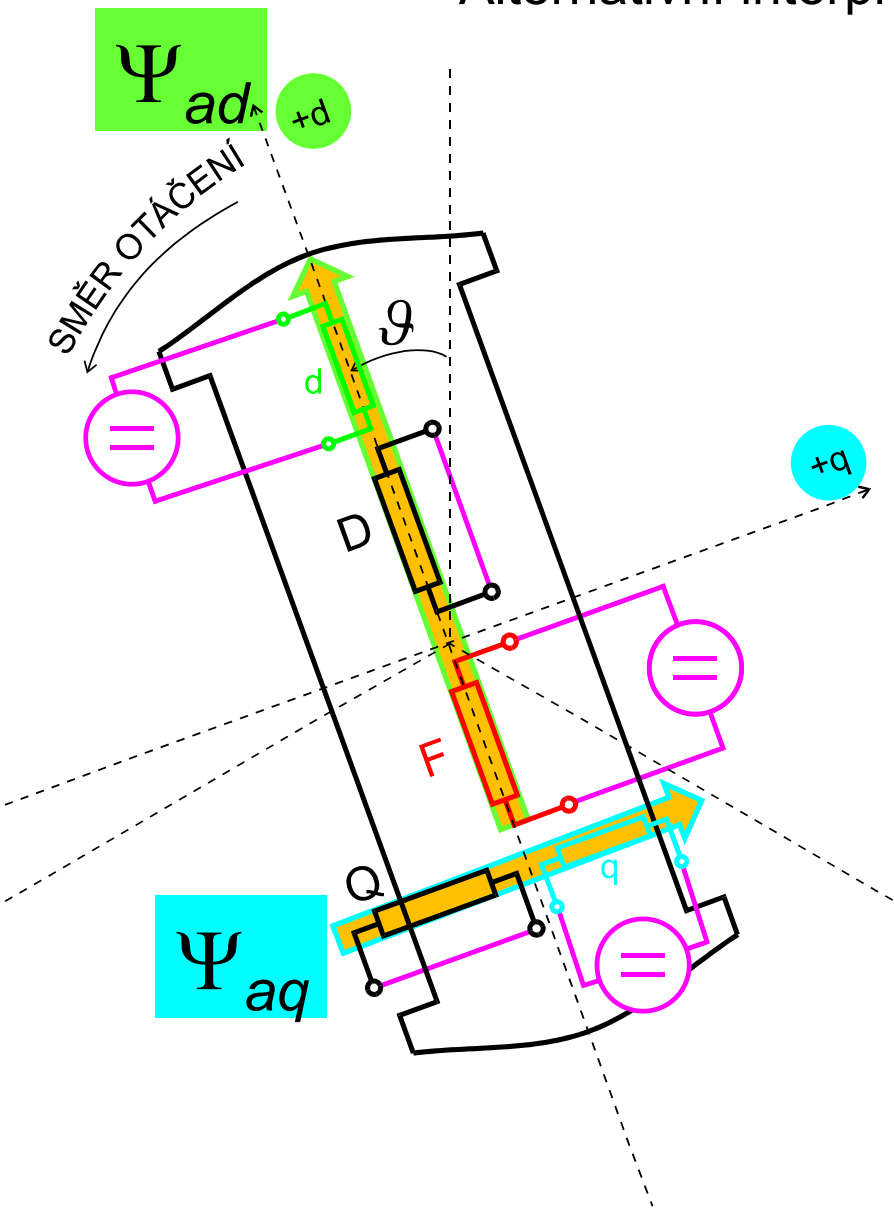
Magnetické toky v jednotlivých vinutích

Spražené magnetické toky



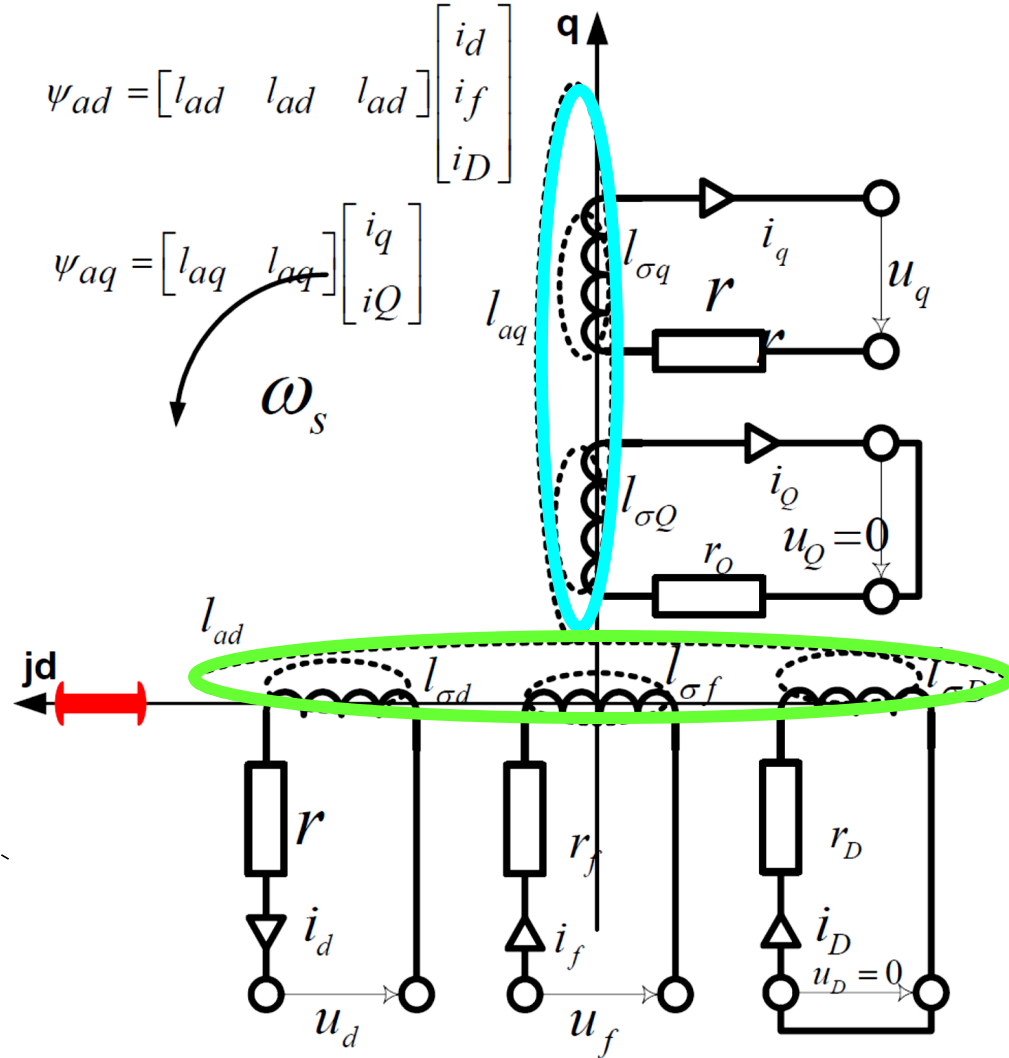
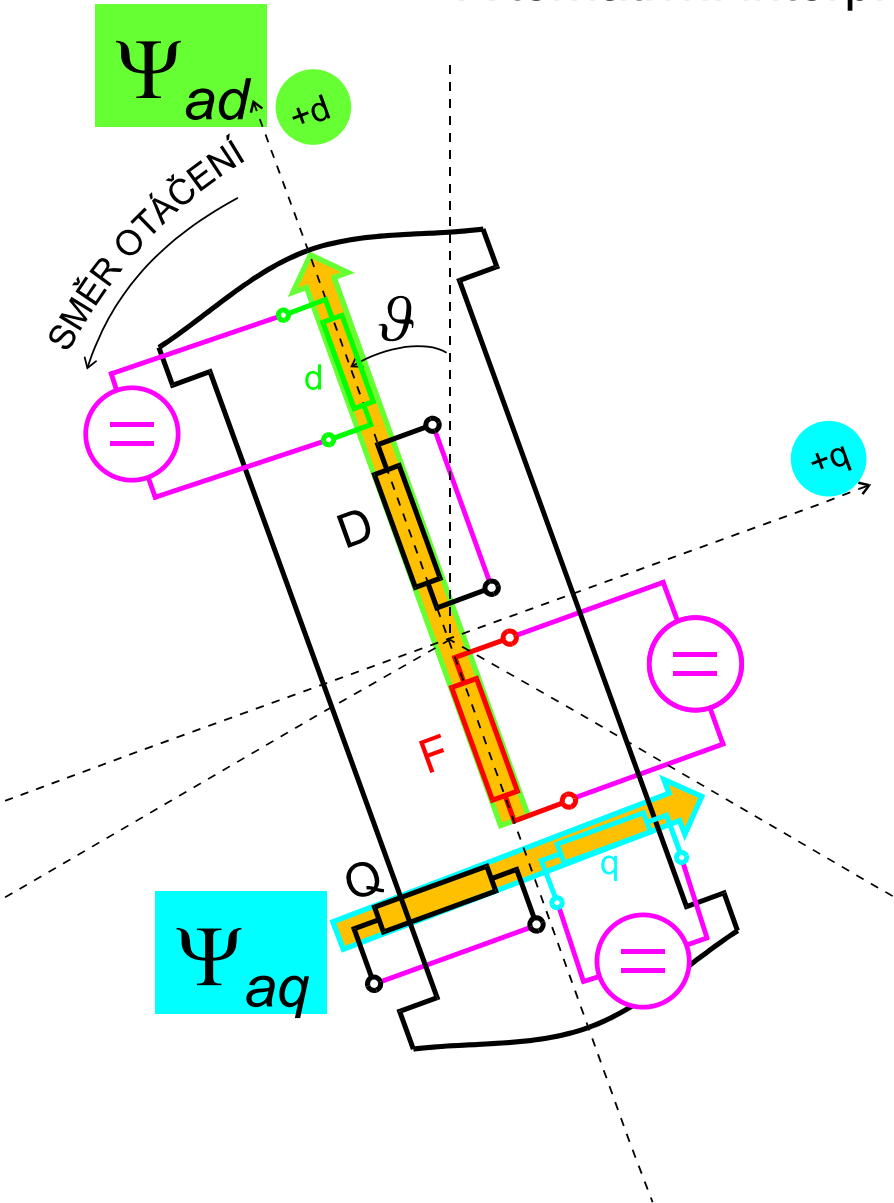
Magnetické toky v jednotlivých vinutích

Alternativní interpretace sprzęžených toků



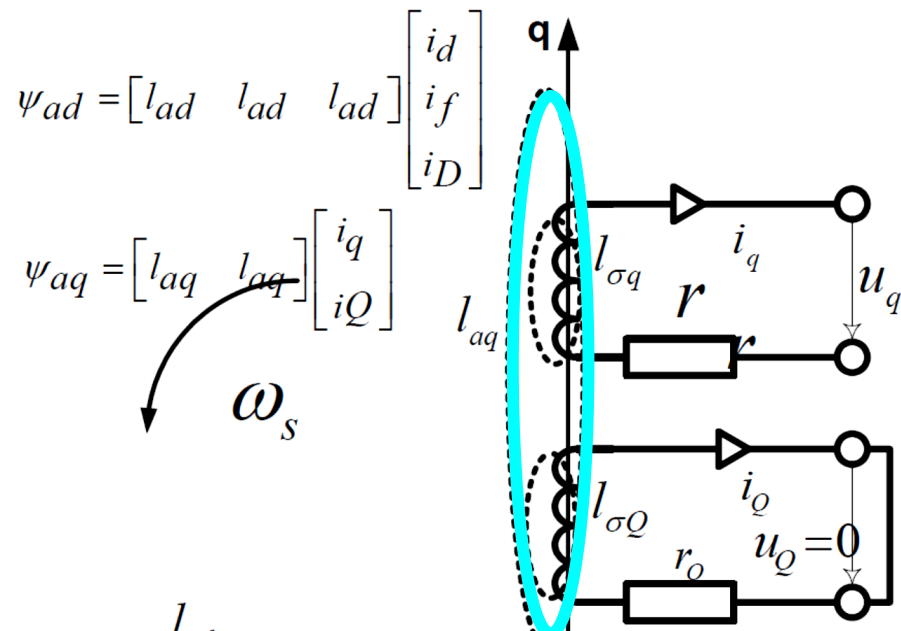
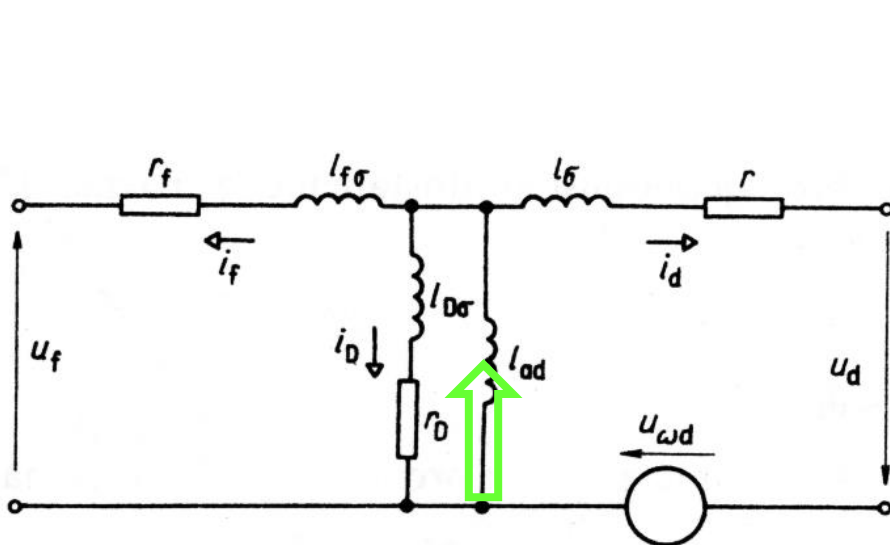
Magnetické toky v jednotlivých vinutích

Alternativní interpretace sprzęžených toků



Magnetické toky v jednotlivých vinutích

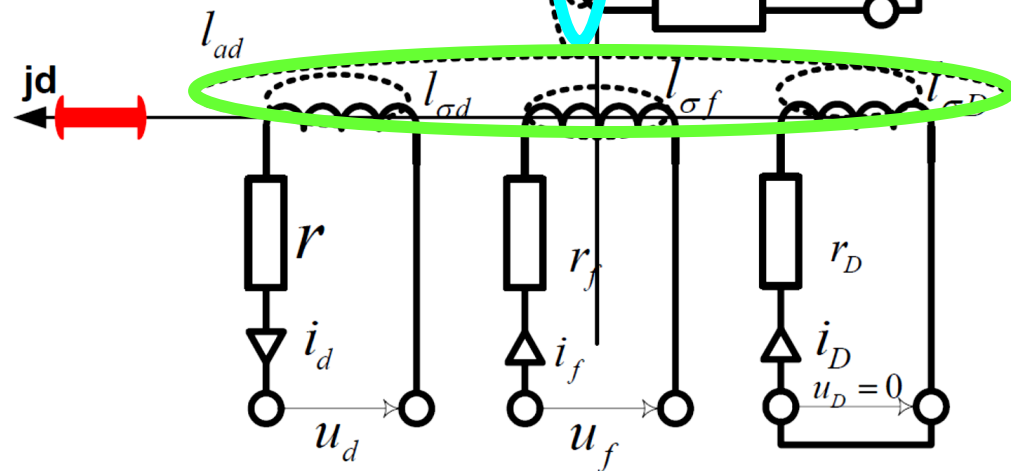
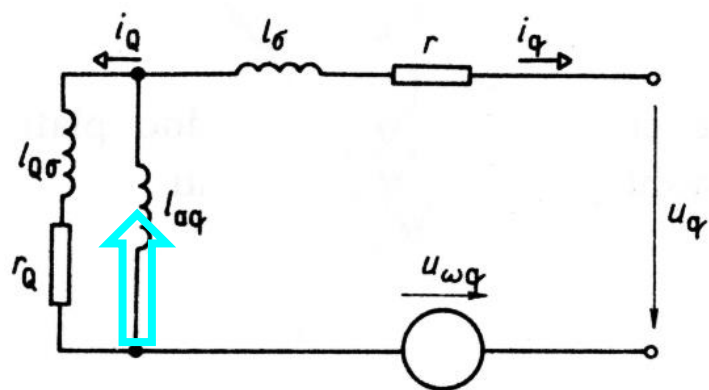
Alternativní interpretace spřažených toků



$$\psi_{ad} = \begin{bmatrix} l_{ad} & l_{ad} & l_{ad} \end{bmatrix} \begin{bmatrix} i_d \\ i_f \\ i_D \end{bmatrix}$$

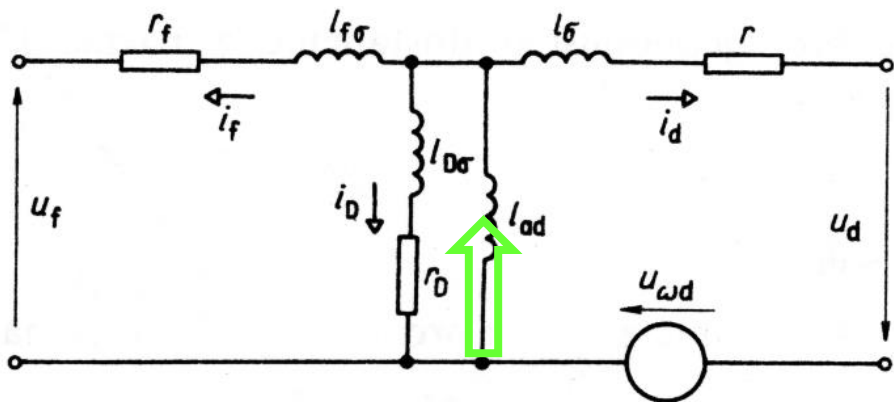
$$\psi_{aq} = \begin{bmatrix} l_{aq} & l_{aq} \end{bmatrix} \begin{bmatrix} i_q \\ i_Q \end{bmatrix}$$

ω_s

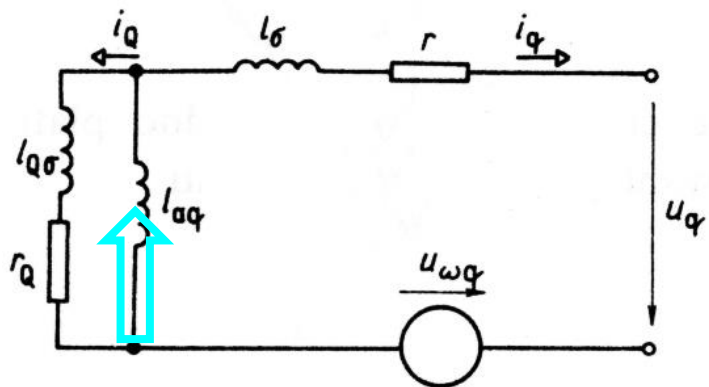
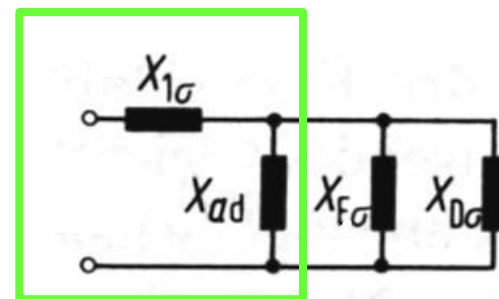


Magnetické toky v jednotlivých vinutích

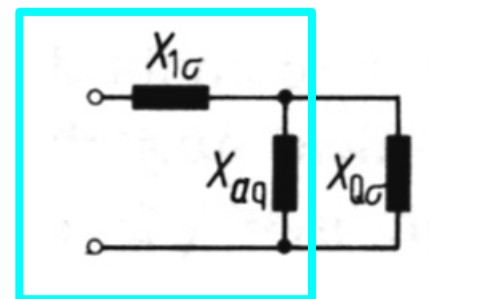
Náhradní satorové reaktance pro ustálený stav



$$x_d = x_\sigma + x_{ad}$$

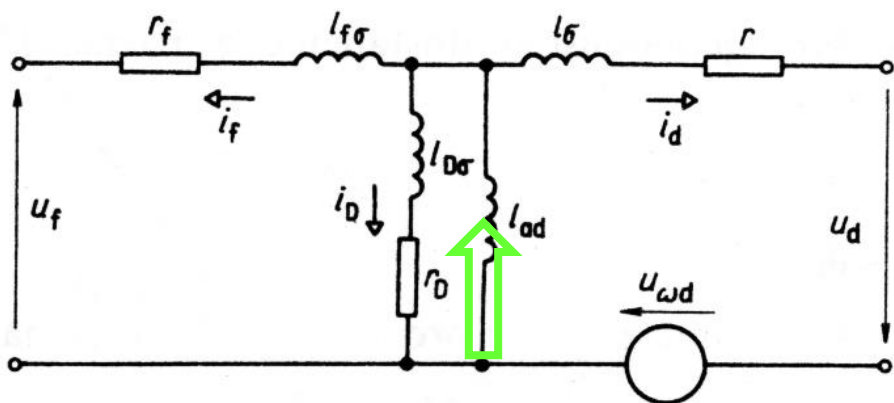


$$x_q = x_\sigma + x_{aq}$$

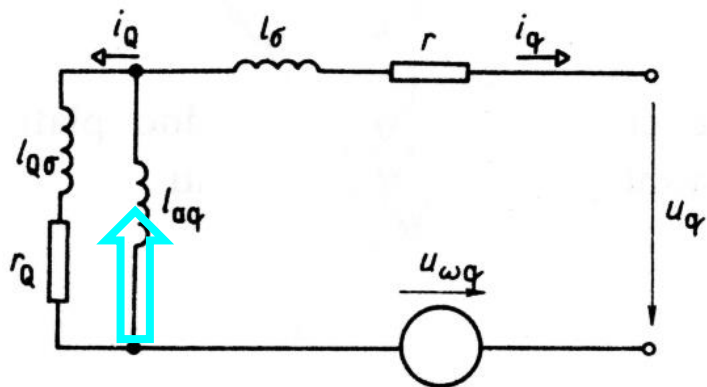
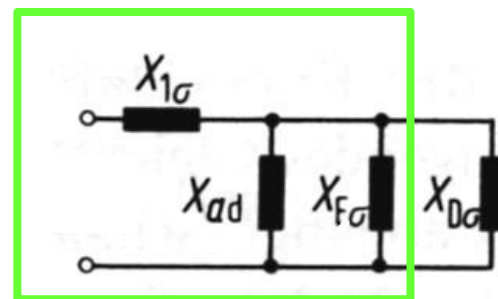


Magnetické toky v jednotlivých vinutích

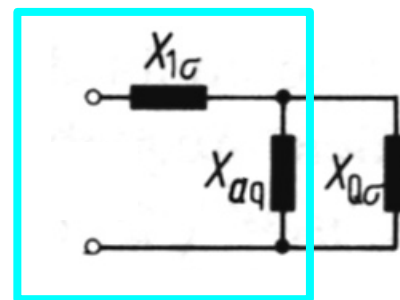
Náhradní satorové reaktance pro přechodný děj



$$x'_d = x_\sigma + \frac{x_{ad}x_{F\sigma}}{x_{ad} + x_{F\sigma}}$$

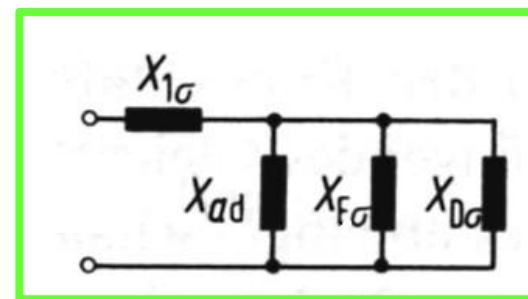
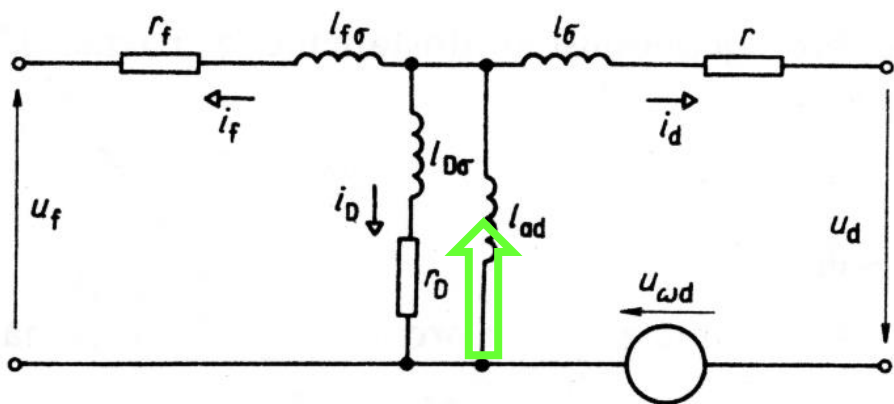


~~$$x'_q = x_\sigma + x_{aq}$$~~

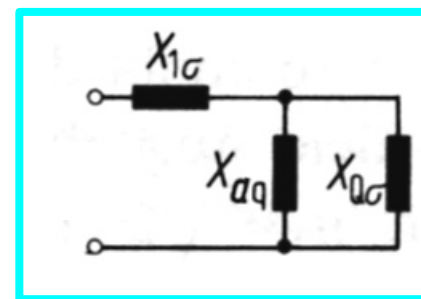
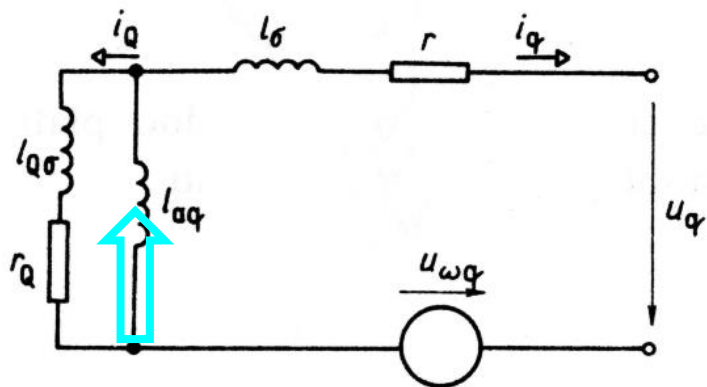


Magnetické toky v jednotlivých vinutích

Náhradní satorové reaktance pro rázový děj



$$x_d'' = x_\sigma + \frac{x_{F\sigma} x_{ad} x_{D\sigma}}{x_{F\sigma} x_{ad} + x_{F\sigma} x_{D\sigma} + x_{ad} x_{D\sigma}}$$



$$x_q'' = x_\sigma + \frac{x_{aq} x_{Q\sigma}}{x_{aq} + x_{Q\sigma}}$$

Magnetické toky v jednotlivých vinutích

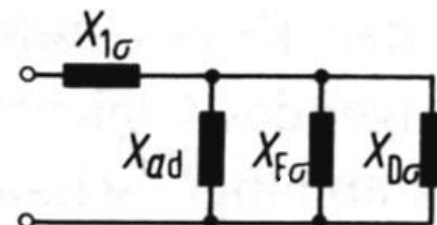
Náhradní satorové reaktance

	Stroj s vyniklými póly	Stroj s hladkým rotorem
x_d	0.9 ÷ 1.5 (1.2)	1.5 ÷ 2.5 (2)
x_q	0.5 ÷ 1.1 (0.8)	~ x_d (nepatrně menší)
x_d'	0.3 ÷ 0.5 (0.4)	0.2 ÷ 0.35 (0.25)
x_d''	0.25 ÷ 0.35 (0.3)	0.15 ÷ 0.25 (0.2)
x_q''	~ x_d''	= x_d''

$$x_d = x_\sigma + x_{ad}$$

$$x_d' = x_\sigma + \frac{x_{ad}x_{F\sigma}}{x_{ad} + x_{F\sigma}}$$

$$x_d'' = x_\sigma + \frac{x_{F\sigma}x_{ad}x_{D\sigma}}{x_{F\sigma}x_{ad} + x_{F\sigma}x_{D\sigma} + x_{ad}x_{D\sigma}}$$



$$x_q = x_\sigma + x_{aq}$$

~~$$x_q' = x_\sigma + x_{aq}$$~~

$$x_q'' = x_\sigma + \frac{x_{aq}x_{Q\sigma}}{x_{aq} + x_{Q\sigma}}$$

