

## STABILITATEA SI CONTROLUL SISTEMELOR ELECTROENERGETICE

### Modelarea generatorului sincron (continuare)

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### Modele dinamice de baza ale generatorului sincron

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### Modele dinamice de baza ale generatorului sincron

Ecuțiile algebrice și diferențiale de funcționare a GS în cele trei regimuri caracteristice permit definirea a 5 modele dinamice de bază ale GS, caracterizate de nivele de complexitate și precizii diferite.

Ordinul unui model corespunde numărului de ecuații diferențiale necesare pentru descrierea modelului respectiv.

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## Modele dinamice de baza ale generatorului sincron

- Structura modelelor dinamice de baza:
- 2 ecuații care descriu procesul tranzitoriu electrodinamic .
  - alte maximum 3 ecuații care descriu procesul tranzitoriu electromagnetic al GS.

Cel mai simplu model dinamic este modelul de ordin II (contine numai cele 2 ecuații care descriu procesul tranzitoriu electrodinamic).

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## Modele dinamice de baza ale generatorului sincron

Variabilele de stare asociate modelelor dinamice de bază ale GS

Ordin model	Proces electrodinamic		Proces electromagnetic				
	$\delta$	$\omega$	$E'_q$	$E'_d$	$E''_q$	$E''_d$	$E_f$
VI	*	*	*	*	*	*	*
V	*	*	*	—	*	*	*
IV	*	*	*	*	—	—	*
III	*	*	*	—	—	—	*
II	*	*	—	—	—	—	—

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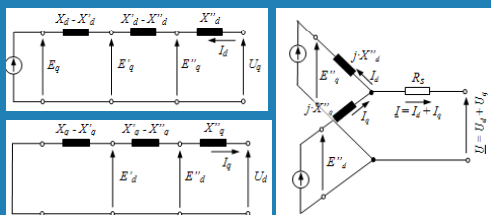
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## Modele dinamice de baza ale generatorului sincron

Modelul de ordin VI (1/2)




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## Modele dinamice de baza ale generatorului sincron

### Modelul de ordin VI (2/2)

Proces tranzitoriu electrodinamic:

$$T_J \frac{d\omega}{dt} = P_m - P_e$$

$$\frac{d\delta}{dt} = \omega$$

Proces tranzitoriu electromagnetic:

$$T'_{d0} \frac{dE'_q}{dt} = E_f - E'_q + (X_d - X'_d) \cdot I_d$$

$$T'_{q0} \frac{dE'_d}{dt} = -E'_d - (X_q - X'_q) \cdot I_q$$

$$T''_{d0} \frac{dE''_q}{dt} = E'_q - E''_q + (X'_d - X''_d) \cdot I_d$$

$$T''_{q0} \frac{dE''_d}{dt} = E'_d - E''_d - (X'_q - X''_q) \cdot I_q$$

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## Modele dinamice de baza ale generatorului sincron

### Modelul de ordin V (1/1)

Proces tranzitoriu electrodinamic:

$$T_J \frac{d\omega}{dt} = P_m - P_e$$

$$\frac{d\delta}{dt} = \omega$$

Proces tranzitoriu electromagnetic:

$$T'_{d0} \frac{dE'_q}{dt} = E_f - E'_q + (X_d - X'_d) \cdot I_d$$

$$T''_{d0} \frac{dE''_q}{dt} = E'_q - E''_q + (X'_d - X''_d) \cdot I_d$$

$$T''_{q0} \frac{dE''_d}{dt} = -E''_d - (X'_q - X''_q) \cdot I_q$$

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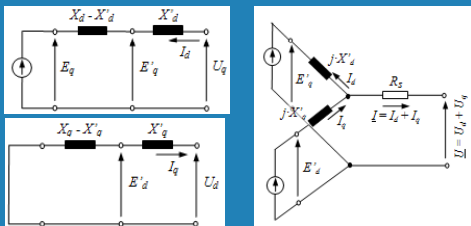
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## Modele dinamice de baza ale generatorului sincron

### Modelul de ordin IV(1/2)




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## Modele dinamice de baza ale generatorului sincron

### Modelul de ordin IV(2/2)

Proces tranzitoriu electrodinamic:

$$T_J \frac{d\omega}{dt} + D \cdot \omega = P_m - P_e$$

$$\frac{d\delta}{dt} = \omega$$

Proces tranzitoriu electromagnetic:

$$T'_{d0} \frac{dE'_q}{dt} = E_f - E'_q + (X_d - X'_d) \cdot I_d$$

$$T'_{q0} \frac{dE'_d}{dt} = -E'_d - (X_q - X'_q) \cdot I_q$$

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## Modele dinamice de baza ale generatorului sincron

### Modelul de ordin III (1/1)

Proces tranzitoriu electrodinamic:

$$T_J \frac{d\omega}{dt} + D \cdot \omega = P_m - P_e$$

$$\frac{d\delta}{dt} = \omega$$

Proces tranzitoriu electromagnetic:

$$T'_{d0} \frac{dE'_q}{dt} = E_f - E'_q + (X_d - X'_d) \cdot I_d$$

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## Modele dinamice de baza ale generatorului sincron

### Modelul de ordin II (1/1)

Proces tranzitoriu electrodinamic:

$$T_J \frac{d\omega}{dt} + D \cdot \omega = P_m - P_e$$

$$\frac{d\delta}{dt} = \omega$$

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**MODELAREA SISTEMELOR DE  
REGLARE AUTOMATA**

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