Livadaras, M.
Adamidis, G. (DUTh, School of Electrical and Computer Engineering)

Ανάλυση και Σύγκριση Μεθόδων Εκκίνησης Ασύγχρονων Κινητήρων Εφαρμόζοντας Άμεσο Έλεγχο Ροπής (Analysis and Comparison of starting methods of Asynchronous Motor Start with Direct Torque Control)

Tech. Chron. Sci J.T.C.G., I, Sep. – Dec. 2010, vol. 1, no 3, pp. 195-210. , tab. , 17 ref.

In this paper there will be investigation of two different starting methods of an induction machine, supplied by a voltage inverter. Direct Torque Control scheme is applied in both of these methods. During the starting period when using DTC scheme, a stator over-current phenomenon occurs. This phenomenon is intense if good acceleration is expected from the control scheme. In the first method, gradual variation of the starting current is applied. As a result, less strain to the power switching devices and to the machines wirings is occurred. The gradual variation is achieved through a specific algorithm, which selects the appropriate value of the reference Torque. The second method is applying stator magnetic flux reinforcement. This reinforcement is applied, because during the starting period and the low speed period, it appears weakening of the stator magnetic flux. This results the problematic operation of the traction system. Thus, in order to achieve a stable stator magnetic flux, for speed lower than the selected reference speed ω_b, reinforcement of the stator magnetic flux is applied.

(Authors)

K-W: Direct Torque Control, Vector Control, Induction Motor, Start-Up Current, Simulation Using MatLab/Simulink

Maglione, R.
Kelessidis, V. (Technical University of Crete, Dep. of Mineral Resources Engineering)

Επιλογή του Καλύτερου Ρεολογικού Μοντέλου για Αιωρήματα Μπεντονίτη-Νερού (Choosing the Best Rheological Model for Water-bentonite Suspensions)

Tech. Chron. Sci J.T.C.G., I, Sep. – Dec. 2010, vol. 1, no 3, pp.211-228 , tab. 5, 37 ref.

Flow of water-bentonite dispersions is encountered in a variety of situations in oil-well drilling, chemical, petroleum and waste treatment industries and in complex geometries like pipe, concentric and eccentric annulus, and rectangular ducts. Most of the time, the flow of these dispersions is laminar and analytical solutions have been developed for a variety of rheological models like the Casson, the Robertson-Stiff, and the Herschel-Bulkley models. Couette viscometers are often used to determine the applicable rheological model but most of the time the shear rates experienced by the fluids are often computed as if the fluids were Newtonian or using a narrow gap approximation, giving thus only approximate values of the rheological parameters for the particular model. Recent advances, though, enable the computation of the true shear rates for any of the three models mentioned. Using Couette viscometric data from the literature, the three models are applied to obtain the rheological parameters using Newtonian and true shear rates in the narrow gap of the viscometer and the best fit model is determined. The flow parameters in laminar flow for pipes and annuli, such as velocity profile, pressure drop gradient as well as the onset of the transition to turbulent flow are then predicted. Differences in the rheological behaviour for all three models and from using Newtonian or true shear rates, as well as on the prediction of the flow parameters are evaluated and discussed.

(Authors)

K-W: Suspension Rheology, Viscometry Yield Behaviour, Pseudoplastic, Theological Models