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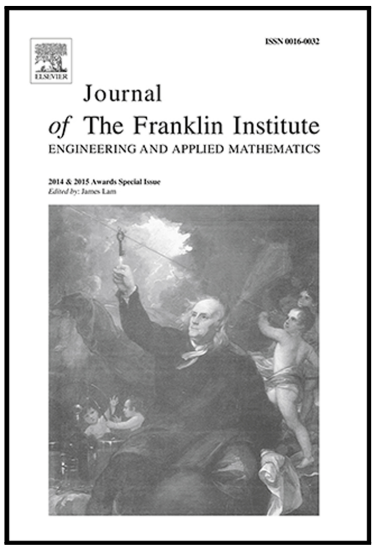

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PII: S0016-0032(17)30333-2
DOI: 10.1016/j.jfranklin.2017.07.019
Reference: FI 3058

To appear in: *Journal of the Franklin Institute*

Received date: 14 June 2016
Revised date: 27 March 2017
Accepted date: 2 July 2017

Please cite this article as: Yibing Sun, Minyue Fu, Bingchang Wang, Huanshui Zhang, Distributed Dynamic State Estimation with Parameter Identification for Large-Scale Systems, *Journal of the Franklin Institute* (2017), doi: 10.1016/j.jfranklin.2017.07.019

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Distributed Dynamic State Estimation with Parameter Identification for Large-Scale Systems☆

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Abstract

In this paper, we consider a distributed dynamic state estimation problem for time-varying systems. Based on the distributed maximum *a posteriori* (MAP) estimation algorithm proposed in our previous study, which studies the linear measurement models of each subsystem, and by weakening the constraint condition as that each time-varying subsystem is observable, this paper proves that the error covariances of state estimation and prediction obtained from the improved algorithm are respectively positive definite and have upper bounds, which verifies the feasibility of this algorithm. We also use new weighting functions and time-varying exponential smoothing method to ensure the robustness and improve the forecast accuracy of the distributed state estimation method. At last, an example is used to demonstrate the effectiveness of the proposed algorithm together with the parameter identification.

Keywords: state estimation, power system, time-varying system, distributed state estimation

2016 MSC: 00-01, 99-00

☆This paper was not presented at any IFAC meeting. This work is supported by the National Science Foundation of China under Grants 61120106011, 61573221, 61403233.

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