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ON THE EQUIVALENCE OF PRIMAL AND DUAL SUBSTRUCTURING PRECONDITIONERS*

BEDŘICH SOUSEDÍK† AND JAN MANDEL‡

Abstract. After a short historical review, we present four popular substructuring methods: FETI-1, BDD, FETI-DP, BDDC, and derive the primal versions to the two FETI methods, called P-FETI-1 and P-FETI-DP, as proposed by Fragakis and Papadrakakis. The formulation of the BDDC method shows that it is the same as P-FETI-DP and the same as a preconditioner introduced by Cros. We prove the equality of eigenvalues of a particular case of the FETI-1 method and of the BDD method by applying a recent abstract result by Fragakis.

Key words. domain decomposition methods, iterative substructuring, finite element tearing and interconnecting, balancing domain decomposition, BDD, BDDC, FETI, FETI-DP, P-FETI-DP.

AMS subject classifications. 65N55, 65M55, 65Y05.

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†Department of Mathematics, Faculty of Civil Engineering, Czech Technical University, Thákurova 7, 166 29 Prague 6, Czech Republic, and Department of Mathematical and Statistical Sciences, University of Colorado Denver, P.O. Box 173364, Campus Box 170, Denver, CO 80217, USA (`bedrich.sousedik@ucdenver.edu`).
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‡Department of Mathematical and Statistical Sciences, University of Colorado Denver, P.O. Box 173364, Campus Box 170, Denver, CO 80217, USA (`jan.mandel@ucdenver.edu`).