

ON THE EQUIVALENCE OF PRIMAL AND DUAL SUBSTRUCTURING PRECONDITIONERS*

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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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