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A NECESSARY AND SUFFICIENT CONVERGENCE CONDITION OF ORTHOMIN(k) METHODS FOR LEAST SQUARES PROBLEM WITH WEIGHT

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Abstract. A class of Orthomin-type methods for linear systems based on conjugate residuals is extended to a form suitable for solving a least squares problem with weight. In these algorithms a mapping matrix as preconditioner is brought into use. We also give a necessary and sufficient condition for the convergence of the algorithm. Furthermore, we also study the construction of the mapping matrix for which the necessary and sufficient condition holds.

Key words and phrases: Conjugate direction, least square methods with weight, Orthomin method, preconditioning.