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Conditioning analysis of incomplete Cholesky factorizations with orthogonal dropping

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We consider incomplete Cholesky factorizations based on orthogonal dropping for the iterative solution of symmetric positive definite linear systems. These methods become increasingly popular tools for computing an approximate factorization of large dense matrices, including update matrices and Schur complements that arise in spares solvers. For the system preconditioned with these incomplete factorization we present an upper bound on the condition number which only depends on the accuracy of the individual approximation (dropping) steps. The analysis is illustrated with some existing factorizations in the context of discretized elliptic partial differential equations.