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Thomas J. Dorsey* (dorsey@ccrwest.org), 4320 Westerra Ct., San Diego, CA 92126, and
Alexander J. Diesl (adiesl@bgsu.edu). *Strongly clean matrix rings.*

An element of a ring is said to be strongly clean if it is the sum of a unit and an idempotent which commute with one another. Previous work of the present authors together with G. Borooah characterized when a matrix ring over a commutative local ring is strongly clean, using a type of factorization (related to Hensel's Lemma) which we called an SRC factorization. In the present work, for an arbitrary (not necessarily commutative) ring, we introduce a type of ideal theoretic factorization which is equivalent to the notion of SRC factorization in the commutative local case. Moreover, we show that this new notion characterizes when a companion matrix over an arbitrary ring is strongly clean (generalizing work of Yang and Zhou in the local case), and we use this to characterize precisely when a matrix ring over an arbitrary commutative ring is strongly clean. (Received September 16, 2008)