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MATRICIAL DECOMPOSITION OF SYSTEMS OVER RINGS[*]

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Abstract. This paper extends to non-controllable linear systems over rings the property FC^s ($s > 0$), which means "feedback cyclization with s inputs": given a controllable system (A, B), there exist a matrix K and a matrix U with s columns such that $(A + BK, BU)$ is controllable. Clearly, FC^1 is the usual FC property. The main technique used in this work is the obtention of block decompositions for systems, with controllable subsystems of a certain size. Each of the studied decompositions is associated to a class of commutative rings for which all systems can be decomposed accordingly. Finally, examples are shown of FC^s rings (for $s > 1$) which are not FC rings.

Key words. Systems over commutative rings, Pole assignability.

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