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ON L9K 1J4, Canada. *Non-sparse companion matrix constructions*. Preliminary report.

A companion matrix is a matrix template for obtaining a prescribed characteristic polynomial. The Frobenius companion matrix is the most familiar companion matrix. It is an example of a sparse companion matrix, having exactly  $n^2 - 2n + 1$  zero entries. Recently all the sparse companion matrices were classified in terms of intercyclic digraphs. In this presentation, we develop constructions for non-sparse companion matrices, noting that some are superpatterns of sparse companion matrices, but some are not, leading to some interesting open questions. (Received September 25, 2017)