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NY. *Square-zero matrices over commutative local rings*. Preliminary report.

Let R be a local ring containing a field, and let D be a lower triangular square matrix with coefficients in the maximal ideal of R . We establish lower bounds on the number of sub-diagonal blocks of D and on the size of the blocks in terms of the homology of D , that is to say, $\text{Ker}(D)$ modulo $\text{Im}(D)$. For rings containing fields, these results may be used to recover the New Intersection Theorem of Peskine, Szpiro, Hochster, and Roberts. The restriction to rings containing fields is due to the use of Hochster's big Cohen-Macaulay modules. (Received September 19, 2005)