1038-94-53   **Ted Hurley*** (`ted.hurley@nuigalway.ie`), Department of Mathematics, National University of Ireland, Galway, Galway, Ireland. *Unit-derived codes.*

Codes are often obtained directly from zero-divisors but codes may be obtained from units as follows.

Suppose the $n \times n$ matrix U over a ring R is a unit. R can be arbitrary as for example a field, an integral domain, a group ring, or even a Laurent series over a group ring. A code may be defined by choosing any rows of U for a generator matrix and a check matrix is then obtained by deleting the corresponding columns of U^{-1}. Each choice of rows will in general give a different code and there are thus many possibilities for a code from a single invertible element.

The unit-derived method is particularly useful and practical when the unit U corresponds to an element u in the group ring RG.

The ring R can be arbitrary and so for example choosing it to be a group ring gives rise to the construction of convolutional codes.

Examples, including applications to constructing LDPC codes and convolutional codes, will be given. (Received January 21, 2008)