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Mathematics, 1409 W. Green Street, Urbana, IL 61801. *Arithmetic of Curves and
Error-Correction.*

Using a construction due to Goppa, algebraic curves can be used to produce error-correcting codes. A method of Feng-Rao and its generalization - the order bound - have been successful in obtaining bounds for the distances of such codes. We translate those methods to an arithmetic geometry setting and generalize them. We define certain semigroups of base point free divisors classes, which capture the supports of subsets of words in the code. Our main theorem gives a computational algorithm to get bounds on those semigroups using only intrinsic properties of Riemann-Roch spaces. Explicit applications of our method to Hermitian curves are presented. (Received September 16, 2009)