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**Abstracts of Short Communications and Posters**

**Section:**

## 16. Applications

1991 MS Classification: 94
Karlof, John, University of North Carolina at Wilmington, U. S. A.
**A Coding Scheme for the Gaussian Multiple Access Channel**
We present a coding-decoding scheme for the Gaussian multiple access channel (GMAC). This scheme is a generalization of a technique originally developed by Urbanke. Urbanke begins by choosing a linear code over the finite field $F_3$ and a set of linearly independent vectors, one for each user. Each user selects an information bit from $F_3$ to be transmitted over the GMAC. Each user's information bit and vector is encoded using the linear code and then mapped to a vector in $R^n$. The vector representing the sum of the mapped codewords plus Gaussian noise is sent to the decoder. We extend Urbanke's results by allowing the choice of any finite field $F_k$, with $k$ an odd prime.