1052-14-116 **Gretchen L. Matthews** (gmatthe@clemson.edu), Department of Mathematical Sciences, Clemson University, Clemson, SC 29634-0975, and **Justin D. Peachey*** (jpeache@clemson.edu), Department of Mathematical Sciences, Clemson University, Clemson, SC 29634-0975.
Riemann-Roch spaces of the norm-trace function field. Preliminary report.

The norm-trace function field over the finite field $\mathbf{F}_{q^r}$ is given by $\mathbf{F}_{q^r}(x,y)/\mathbf{F}_{q^r}$ where $N_{\mathbf{F}_{q^r}/\mathbf{F}_q}(x) = Tr_{\mathbf{F}_{q^r}/\mathbf{F}_q}(y)$, meaning the norm of x is equal to the trace of y with respect to the extension $\mathbf{F}_{q^r}/\mathbf{F}_q$. It is a generalization of the Hermitian function field over $\mathbf{F}_{q^2}$, which is obtained when $r=2$. The norm-trace function field has $q^{2r-1}+1$ places of degree one, including q^{r-1} places P_{0b} and a single place at infinity P_∞. In this talk, we determine explicit bases for Riemann-Roch spaces $\mathcal{L}\left(a_0P_\infty + a_1P_{0b_1} + \cdots + a_mP_{0b_m}\right)$ where $1 \leq m \leq q^{r-1}$ and discuss some applications. (Received August 24, 2009)