Cyclically Indecomposable Cyclic $\lambda$-fold Triple Systems that are Decomposable for $\lambda = 2, 3, 4$. 

Martin Grüttmüller, Nabil Shalaby and Daniela Silvesan*

Department of Mathematics and Statistics
Memorial University of Newfoundland, Canada
danielas@mun.ca

A $CTS_{\lambda}(v)$ is called cyclically indecomposable if its block set $B$ cannot be partitioned into sets $B_1, B_2$ of blocks to form $CTS_{\lambda_1}(v)$ and $CTS_{\lambda_2}(v)$, where $\lambda_1 + \lambda_2 = \lambda$, $\lambda_1, \lambda_2 \geq 1$.

In this talk we show that a cyclic two-fold triple system is cyclically indecomposable if and only if it is indecomposable. Moreover, we construct cyclic three-fold triple systems of order $v$ which are cyclically indecomposable but decomposable for all $v \equiv 3 \pmod{6}$. We present a construction which yields infinitely many cyclically indecomposable but decomposable cyclic three-fold triple systems of order $v \equiv 1 \pmod{6}$ and infinitely many cyclically indecomposable but decomposable cyclic four-fold triple systems of order $v \equiv 0$ or $1 \pmod{3}$. 