1135-60-1551 **Alan Krinik***, ackrinik@cpp.edu, and **Uyen Nguyen**, **Ali Oudich**, **Pedram Ostadhassanpanjehali**, **Luis Cervantes**, **Chon In Luk**, **Matthew McDonough**, **Jeffrey Yeh** and **Lyheng Phey**. *Matrix properties of a class of birth-death chains and processes.*

Consider a birth-death chain on state space $S = \{0, 1, 2, \ldots, H\}$ where $H \in \mathbb{N}$ with alternating birth probabilities $c_1, c_2, c_1, c_2 \ldots$ and alternating death probabilities $a_1, a_2, a_1, a_2 \ldots$ where $0 < c_i < 1$, $0 < a_i < 1$ and $a_i + c_i \leqq 1$ for $i = 1, 2$. Assume $a_1 c_2 = a_2 c_1$ or $a_1 c_1 = a_2 c_2$. Suppose P is the one-step transition probability matrix associated with this birth-death chain and let $P*$ be the one-step transition probability matrix of the corresponding dual birth-death chain.

Conclusions:

1) The set of eigenvalues of P and $P*$ are the same and are determined as a function of H.

2) P^n and $(P^*)^n$ can be determined exactly for $n \in \mathbb{N}$.

3) Birth-death chains that have the same set of eigenvalues are identified.

4) Related results for birth-death processes and non-birth-death chains are discussed. (Received September 23, 2017)