1145-41-2622 **Catherine Payne***, payneca@wssu.edu, and **R. Fabiano**. *Semidiscrete approximation of linear neutral delay differential equations.*

We consider semidiscrete approximation of a linear neutral delay differential equation of the form

$$\frac{d}{dt}\left[x(t)+\sum_{k=1}^{n}C_k x(t-r_k)\right]=Ax(t)+\sum_{k=1}^{n}B_k x(t-r_k)$$

with appropriate initial data. We assume that A, $B_1, B_2, \ldots, B_n$ and $C_1, C_2, \ldots, C_n$ are complex $m \times m$ matrices. We reformulate the neutral equation as an abstract Cauchy problem $\dot{z}(t) = \mathcal{A}z(t)$ and describe a spline-based approximation scheme. The approximation scheme we use converges for both the solution semigroup and its adjoint, which gives better results than related schemes in applications involving control problems. We will finish with some examples to show that this scheme can be used in problems with both continuous and discontinuous initial data. (Received September 25, 2018)