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Catherine Payne* (capayne2@uncg.edu) and **Richard Fabiano**. *Approximation of linear neutral delay differential equations*. Preliminary report.

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, \dots, B_n and C_1, C_2, \dots, 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 discuss the construction of an approximation scheme which yields convergence for both the operator \mathcal{A} and its adjoint. This property is needed in some control problems. Finally, we discuss some examples to compare this result with existing approximation schemes. (Received September 12, 2016)