

## ON A SYSTEM OF DIFFERENTIAL EQUATIONS WITH COMPLEX COEFFICIENTS

ICE B. RISTESKI<sup>1</sup> AND KOSTADIN G. TRENČEVSKI<sup>2</sup>

**Abstract.** In this paper is solved one characteristic system of differential equations with constant complex coefficients. It is our duty first to say that until now in the classic literature of matrix differential equations [1, 2, 3] as well as in the periodical journals, this problem was not considered

### 1. FORMULATION OF THE PROBLEM

The problem is to solve the following system of differential equations

$$Y' = AY \tag{1}$$

where  $A = [a_{ij}]$  is a complex quadratic matrix of order  $n + 1$  with the following elements

$$a_{ii} = -(2i + 1)n + i(2i - z), \quad (0 \leq i \leq n)$$

$$a_{i,i+1} = (i + 1)(n + z - i), \quad (0 \leq i \leq n - 1)$$

$$a_{i,i-1} = i(n - i + 1), \quad (1 \leq i \leq n)$$

$$a_{ij} = 0, \quad (|i - j| > 1, \quad 0 \leq i, j \leq n)$$

for  $z \in \mathbf{C}$  and

$$Y = [y_0, y_1, \dots, y_n]^T,$$

$$Y' = \left[ \frac{dy_0}{dt}, \frac{dy_1}{dt}, \dots, \frac{dy_n}{dt} \right]^T.$$

---

2000 Mathematics Subject Classification. 34A30, 15A18.

Key words and phrases. system differential equations, eigenvalues, eigenvectors.