

# Existence of complex $\ell_2$ solutions of linear delay systems of difference equations

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We give sufficient conditions for the existence of complex  $\ell_2$  solutions of a non-homogeneous system of linear difference equations and of two general classes of delay systems of linear difference equations. In some cases, bounds of the established solutions are also given. As a consequence of the space  $\ell_2$  where we work, information can be obtained about the asymptotic behavior of the established solutions and, the asymptotic stability of the zero equilibrium point of the systems under consideration. The method we use is a functional-analytic one.

**Keywords:** Delay;  $\ell_2$  solutions; Existence; Difference equations

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