



# Fault Detection Filter for Linear Time-Delay Systems

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**Abstract:** By extension of a fault detection optimization approach to linear time invariant (LTI) systems, this short paper deals with the fault detection filter (FDF) problem for linear time-delay systems with  $L_2$ -norm bounded unknown inputs. The basic idea is first to introduce a new FDF as the residual generator; and then based on an objective function to formulate the FDF design as an optimization problem. Through appropriate choice of the filter gain matrix and a post-filter, the convergence of the residual generator and satisfactory FDF performance can be achieved. A numerical example is given to illustrate the effectiveness of the proposed method.

**Keywords:** *Fault detection; filter; robustness; sensitivity; time delay.*

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