# SOME MODIFICATIONS of the WEISS–STAFFANS PERTURBATION THEOREM

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## Abstract

For boundary control systems in factor form a version of the Weiss perturbation result is derived and formulated as an exponential stability robustness result (Theorem 3.1). An example of a heating rod control, illustrating its application is given.

Next a generalization of the Weiss perturbation to a class of retarded systems of the neutral type is presented (Theorem 4.1). The characteristic feature of this generalization is that it allows to deal with a dynamic perturbation rather than a static one. Using this result we get a new derivation of an exponential stability criterion.

We also show that some parabolic systems without the admissibility of control operator still admit a weakened version of the Weiss perturbation result (Theorem 5.1). This result is a consequence of the maximal parabolic regularity and the Balakrishnan–Washburn estimates, and is illustrated in details by an example of an unloaded electric $\mathfrak{RC}$–transmission line.