

## A FAMILY OF NECESSARY STABILITY INEQUALITIES VIA QUADRATIC FORMS

PRASHANT BATRA

*Abstract.* Inequalities relating three coefficients of the even or odd part of a Hurwitz-stable polynomial have been established recently via the Newton-MacLaurin inequalities, and via optimization techniques for multivariate functions on the positive orthant. From the theory of quadratic forms we derive a family of strict inequalities which includes and generalizes the known inequalities. For polynomials of higher degree quantifiable improvements are obtained. Benefit of these inequalities is low-cost instability testing for polynomials with varying coefficients.

*Mathematics subject classification (2010):* 15A63, 26C10, 93D09.

*Keywords and phrases:* Quadratic forms, Cauchy index, stability conditions, interval polynomial.

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