

AN INEQUALITY BETWEEN THE INTEGRAL NORM AND EUCLIDEAN NORM OF A SYMMETRIC BILINEAR FORM

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Abstract. In this note, we establish an inequality between the integral norm and Euclidean norm of a symmetric bilinear form f on a Euclidean space E^n , i.e.,

$$\frac{1}{\text{vol } S^{n-1}} \int_{S^{n-1}} f^2(\theta, \theta) d\theta \leq \frac{1}{n} |f|_{Euc}^2$$

where the equality holds if and only if the eigenvalues of f are all the same.

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