

# Fourier Series Approximation in Semi-normed Spaces <sup>†</sup>

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**Abstract:** We study the approximation properties of  $2\pi$ -periodic functions in certain semi normed spaces, under some assumptions on the involved seminorm  $P$ . Namely, the seminorm  $P$  is either “order monotonic”, or controlled by the  $L_p[0, 2\pi)$  – norm. We use a general matrix method of summability and the moduli of continuity in the semi-normed space to measure approximation. Our results generalize and improve some of the previous results available in the literature. In each of the cases, some subcases with stronger assumptions are considered, namely that the matrix involved in the summation method is triangular, and the entries of such a matrix satisfy a condition related to bounded variation. It is shown that under these stronger assumptions, the estimates can be improved.

**Keywords:** semi normed spaces; summability, and the moduli of continuity.

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## Conflicts of Interest

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