International scientific conference

«Algebraic and geometric methods of analysis»

Book of abstracts

May 30 - June 4, 2018,
Odesa,
Ukraine

https://www.imath.kiev.ua/~topology/conf/agma2018

Some new applications on absolute matrix summability

Sebnem Yildiz
(Department of Mathematics, Ahi Evran University, Kırsehir, Turkey)
E-mail: sebnemyildiz@ahievran.edu.tr; sebnem.yildiz82@gmail.com

In this paper, Theorem 1 and Theorem 2 on weighted mean summability methods of Fourier series have been generalized for $|A, p_n|_k$ summability factors of Fourier series by using different matrix transformations. New results have been obtained dealing with some other summability methods.

Theorem 1. *Let (p_n) be a sequence such that*

$$P_n = O(np_n) \tag{1}$$

$$P_n \Delta p_n = O(p_n p_{n+1}). \tag{2}$$

If $\varphi_1(t)$ is of bounded variation in $(0, \pi)$ for any $x \in (-\pi, \pi)$ and (λ_n) is a sequence such that

$$\sum_{n=1}^{\infty} \frac{1}{n} |\lambda_n|^k < \infty \tag{3}$$

and

$$\sum_{n=1}^{\infty} |\Delta \lambda_n| < \infty, \tag{4}$$

then the series $\sum C_n(t) \frac{\lambda_n P_n}{n p_n}$ is summable $| \bar{N}, p_n |_k$, $k \geq 1$
(taken from [2]).

Theorem 2. *If the sequences (p_n) and (λ_n) satisfy the conditions (1)-(4) of Theorem 1 and*

$$B_n \equiv \sum_{v=1}^{n} v a_v = O(n), \quad n \to \infty, \tag{5}$$

then the series $\sum a_n \frac{\lambda_n P_n}{n p_n}$ is summable $| \bar{N}, p_n |_k$, $k \geq 1$(taken from [2]).

Lemma 3. *If $\varphi_1(t)$ is of bounded variation in $(0, \pi)$ for any $x \in (-\pi, \pi)$, then*

$$\sum v C_v(x) = O(n) \quad as \quad n \to \infty \tag{6}$$

(taken from [11]).

Lemma 4. *If the sequence (p_n) such that conditions (1) and (2) of Theorem 1 are satisfied, then*

$$\Delta \left\{ \frac{P_n}{p_n n^2} \right\} = O\left(\frac{1}{n^2} \right) \tag{7}$$

(taken from [2]).

Acknowledgments
This work supported by Ahi Evran University Scientific Research Projects Coordination Unit. Project Number: FEF.A3.17.003

References

[1] H. Bor. On two summability methods. *Math. Proc. Cambridge Philos. Soc*, 97: 147–149, 1985. 0

[2] H. Bor. Multipliers for $\left|\bar{N}, p_n\right|_k$ summability of Fourier series. *Bull. Inst. Math. Acad. Sinica*, 17: 285–290, 1989.

[3] H. Bor. On the local property of $\mid \bar{N}, p_n \mid_k$ summability of factored Fourier series. *J. Math. Anal. Appl.*, 163: 220–226, 1992.

[4] H. Bor. On local property of $\mid \bar{N}, p_n; \delta \mid_k$ summability of factored Fourier series. *J. Math. Anal. Appl.*, 179: 646–649, (1993).

[5] H. Bor. On the local property of factored Fourier series. *Z. Anal. Adwend.*, 16: 769–773, (1997).

[6] H. Bor. Factors for $\left|\bar{N}, p_n, \theta_n\right|_k$ summability of Fourier series. *Bull. Inst. Math. Acad. Sin. (N.S.)*, 3: 399–406, 2008.

[7] H. Bor. Some new results on infinite series and Fourier series. *Positivity*, 19: 467–473, (2015).

[8] H. Bor. Some new results on absolute Riesz summability of infinite series and Fourier series. *Positivity*, 20: 599–605, 2016.

[9] G. H. Hardy. Divergent Series. *Oxford University Press Oxford* (1949).

[10] T. M. Flett. On an extension of absolute summability and some theorems of Littlewood and Paley. *Proc. Lond. Math. Soc.*, 7: 113–141, (1957).

[11] K. N. Mishra. Multipliers for $\mid \bar{N}, p_n \mid$ summability of Fourier series. *Bull. Inst. Math. Acad. Sinica*, 14: 431–438, (1986).

[12] H. S. Özarslan and Ş. Yıldız. A new study on the absolute summability factors of Fourier series. *J. Math. Anal.*, 7: 31–36, (2016).

[13] W. T Sulaiman. Inclusion theorems for absolute matrix summability methods of an infinite series. *IV Indian J. Pure Appl. Math.*, 34(11): 1547–1557, (2003).

[14] N. Tanovič-Miller. On strong summability. *Glas. Mat.*, 34 (14): 87–97, (1979).

[15] S. Yıldız. A new theorem on local properties of factored Fourier series. *Bull. Math. Anal. App.*, 8 (2): 1–8, (2016).

[16] S. Yıldız. A new note on local property of factored Fourier series. *Bull. Math. Anal. Appl.*, 8 (4): 91–97, (2016).

[17] S. Yıldız. On Riesz summability factors of Fourier series. *Trans. A. Razmadze Math. Inst.*, 171: 328–331, (2017).

[18] S. Yıldız. A new generalization on absolute matrix summability factors of Fourier series. *J. Inequal. Spec. Funct.*, 8 (2): 65–73, (2017).

[19] S. Yıldız. On Absolute Matrix Summability Factors of infinite Series and Fourier Series. *Gazi Univ. J. Sci.*, 30 (1): 363–370, (2017).

[20] Ş. Yıldız. A new theorem on absolute matrix summability of Fourier series. *Pub. Inst. Math. (N.S.)*, 102 (116):107–113,(2017).

[21] S. Yıldız. On Application of Matrix Summability to Fourier Series. *Math. Methods Appl. Sci.*, 41 (11):1–7, (2018).

[22] S. Yıldız. On the absolute matrix summability factors of Fourier Series. *Math. Notes*, 103 (2):155–161, (2018).