

ON WIENER'S TAUBERIAN THEOREMS AND CONVOLUTION FOR OSCILLATORY INTEGRAL OPERATORS

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The main aim of this talk is to present new Paley-Wiener and Wiener's Tauberian results associated with an oscillatory integral operator (which is depending on cosine and sine kernels), as well as to introduce a consequent new convolution. Additionally, a new Young-type inequality for the obtained convolution is proved, and a new Wiener type algebra is also associated with this convolution.

REFERENCES

- [1] Brascamp, Herm Jam; Lieb, Elliot. Best constants in Young's inequality, its converse, and its generalization to more than three functions. *Adv Math* 20: 151–173, 1976.
- [2] Castro, Luís Pinheiro; Guerra, Rita Correia; Tuan, Nguyen Minh. Heisenberg uncertainty principles for an oscillatory integral operator. *American Institute of Physics, AIP Proc* 1798(1): 020037, 10pp., 2017.
- [3] Frank, Rupert; Sabin, Julien. Spectral cluster bounds for orthonormal systems and oscillatory integral operators in Schatten spaces. *Adv Math* 317: 157–192, 2017.
- [4] Korevaar, Jacob. A century of complex Tauberian theory. *Bull Amer Math Soc (NS)* 39: 47–531, 2002.
- [5] Korevaar, Jacob. *Tauberian Theory: A Century of Developments*. Grundlehren der Mathematischen Wissenschaften 329, Springer-Verlag, 2004.
- [6] Korevaar, Jacob. Distributional Wiener-Ikehara theorem and twin primes. *Indagationes Mathematicae (NS)* 16: 3–49, 2005.
- [7] Motygin, Oleg Valerievich. Numerical approximation of oscillatory integrals of the linear ship wave theory. *Appl Numer Math* 115: 99–113, 2017.
- [8] Novak, Erich; Ullrich, Mario; Woźniakowski, Henryk; Zhang, Shun. Complexity of oscillatory integrals on the real line. *Adv Comput Math* 43(3): 537–553, 2017.
- [9] Pitt, Harry Raymond. General Tauberian theorems. *Proc London Math Soc* 44: 243–288, 1938.
- [10] Rudin, Walter. *Functional Analysis*. McGraw-Hill, 1991.
- [11] Sjölin, Per. Some remarks on singular oscillatory integrals and convolution operators. *Proc Am Math Soc* 145(9): 3843–3848, 2017.
- [12] Tuan, Nguyen Minh; Tuan, Phan Duc. Operator properties and Heisenberg uncertainty principles for a un-unitary integral operator. *Integral Transforms Spec Funct* 23: 1–12, 2012.
- [13] Veys, Willem; Zúñiga-Galindo, Wilson. Zeta functions and oscillatory integrals for meromorphic functions. *Adv Math* 311: 295–337, 2017.
- [14] Xiao, Lechao. Endpoint estimates for one-dimensional oscillatory integral operators. *Adv Math* 316: 255–291, 2017.
- [15] Xu, Zhenhua; Xiang, Shuhuang. Gauss-type quadrature for highly oscillatory integrals with algebraic singularities and applications. *Int J Comput Math* 94(6): 1123–1137, 2017.

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