J. Adv. Math. Stud.
Vol. **18**(2025), No. 1, 74-85
http://journal.fairpartners.ro

PSEUDO-DIFFERENTIAL TYPE OPERATORS ASSOCIATED WITH HANKEL TYPE TRANSFORM

BALASAHEB B. WAPHARE AND RAHILANAZ Z. SHAIKH

Abstract. In this paper, we define and discuss the fundamental properties of a pseudo-differential operator involving the Hankel transform, along with its amplitude and symbol. Also, it is defined and demonstrated that the Kernal of the pseudo-differential operator $h_{\alpha,\beta,a}$ is pseudo-local. The product of pseudo-differential operators is proved to be a pseudo-differential operator.

REFERENCES

[1] L. Nirenberg: *Pseudo-differential operators*, in: Proc. 16th Sympos. Pure Math., 1970.
[2] R.S. Pathak and K.K. Shrestha: *Generalized Sobolev type spaces*, in: Proc. Indian National Sci. Acad. A, **1** (2003), 75-92.
[3] A. Prasad: *On pseudo-differential operators involving Hankel transform*, Can. J. Comp. Sci. Math., **1**(2010), No. 1, 1-20.
[4] L. Rodino: *Linear Partial Differential Operators in Gevrey Spaces*, World Scientific, Singapore, 1993.
[5] J. Treves: *Introduction to Pseudo-Differential Fourier Integral Operators*, Plenum Press, New York, 1980.
[6] B.B. Waphare and S.G. Gajbhiv: *Pseudo-differential type operators and Gevrey spaces*, Asian-Eur. J. Math., **13**(2020), No. 1, Art. No. 2050027.
[7] B.B. Waphare: *Pseudo-differential operators associated with Bessel type operators-I*, Thai J. Math., **8**(2012), No. 1, 51-62.
[8] M.W. Wong: *An Introduction to Pseudo-Differential Operators*, World Scientific, Singapore, 1991.
[9] A.H. Zemanian: *Generalized Integral Transformations*, Interscience, New York, 1968.

MAEER's MIT Arts, Commerce & Science College
Department of Mathematics
Alandi(D), Pune-412105, Maharashtra, India
Email address: balasahebwaphare@gmail.com

MAEER's MIT Arts, Commerce & Science College
Department of Mathematics
Alandi(D), Pune-412105, Maharashtra, India
Email address: shaikhrahilanaz@gmail.com

Received: August 08, 2024. *Revised:* December 11, 2024.
2020 *Mathematics Subject Classification*: 46F05, 46F12.
Key words and phrases: Pseudo-differential operator, Hankel type transform, Hankel type potential, singular support, pseudo-local.

©2025 Fair Partners Society for the Promotion of Science & Fair Partners Publishers