



Ann. Funct. Anal. 5 (2014), no. 1, 10–23

ANNALS OF FUNCTIONAL ANALYSIS

ISSN: 2008-8752 (electronic)

URL: [www.emis.de/journals/AFA/](http://www.emis.de/journals/AFA/)

## QUADRATIC FOURIER TRANSFORMS

L. P. CASTRO<sup>1\*</sup> M. R. HAQUE<sup>2</sup> M. M. MURSHED<sup>2</sup> S. SAITOH<sup>1</sup> AND N. M. TUAN<sup>3</sup>

*Dedicated to Professor Tsuyoshi Ando in celebration of his distinguished achievements in Matrix Analysis and Operator Theory*

Communicated by C. Cuevas

ABSTRACT. In this paper we shall examine the quadratic Fourier transform which is introduced by the generalized quadratic function for one order parameter in the ordinary Fourier transform. This will be done by analyzing corresponding six subcases of the quadratic Fourier transform within a reproducing kernel Hilbert spaces framework.

<sup>1</sup>CENTER FOR R&D IN MATHEMATICS AND APPLICATIONS, DEPARTMENT OF MATHEMATICS, UNIVERSITY OF AVEIRO, 3810-193 AVEIRO, PORTUGAL.

*E-mail address:* [castro@ua.pt](mailto:castro@ua.pt); [saburou.saitoh@gmail.com](mailto:saburou.saitoh@gmail.com)

<sup>2</sup>DEPARTMENT OF MATHEMATICS, UNIVERSITY OF RAJSHAHI, RAJSHAHI-6205, BANGLADESH.

*E-mail address:* [mrhaque09@gmail.com](mailto:mrhaque09@gmail.com); [mmmurshed82@gmail.com](mailto:mmmurshed82@gmail.com)

<sup>3</sup>DEPARTMENT OF MATHEMATICS, COLLEGE OF EDUCATION, VIET NAM NATIONAL UNIVERSITY, G7 BUILD., 144 XUAN THUY RD., CAU GIAY DIST., HANOI, VIETNAM.

*E-mail address:* [tuannm@hus.edu.vn](mailto:tuannm@hus.edu.vn); [nguyentuan@vnu.edu.vn](mailto:nguyentuan@vnu.edu.vn)

---

*Date:* Received: 13 March 2013; Accepted: 28 April 2013.

\* Corresponding author.

2010 *Mathematics Subject Classification.* Primary 42A38; Secondary 30C40, 32A36, 46E22.

*Key words and phrases.* Fourier transform, quadratic Fourier transform, reproducing kernel, Bergman–Selberg space, analytic extension formula.