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1003-44-957 **Bharat Namdev Bhosale*** (bnbhosale@rediffmail.com), Principal, S.H.Kelkar College, Devgad, Devgad, India. *Fractional fourier Transform of Tempered Distributions.*

In this paper, the fractional Fourier transform is extended to the Tempered distributions basing it on the Howell's "new" theory of Fourier analysis, thus, presenting an entirely a new approach. For this purpose, the space G, conceived by Howell of rapidly decreasing test functions is considered. It is shown that the space is invariant under the fractional FT. The fractional FT is defined on this space of test functions and shown that this transform is a one-to-one continuous mapping from the space of test functions onto itself. Other fundamental results are discussed as appropriate in the context of fractional FT. By extending the analysis to the dual of this space, a theory that generalizes the well-known theory for tempered distributions is developed. Attributed by the features of the fractional FT of deterministic and random objects with scaling properties it is related to parameters like probability in quantum mechanics and intensity distribution in optics and signal processing. Further analysis of the squared moduli of the fractional FT (often named as Radon-Wigner transform (RWT) which, for a = p/2, corresponds to ordinary Fourier spectrum, that is usually used for the analysis of fractals. (Received October 01, 2004)