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Plamen Stefanov* (stefanov@math.purdue.edu). *Semiclassical Sampling and Discretization of Linear Inverse Problems.*

We study sampling of functions f and their images Af under Fourier Integral Operators A at rates sh with s fixed and h a small parameter. We show that the Nyquist sampling limit of Af and f are related by the canonical relation of A using semiclassical analysis. We apply this analysis to the Radon transform in the parallel and the fan-beam coordinates. We explain and illustrate the optimal sampling rates for Af , the aliasing artifacts, and the effect of averaging (blurring) the data Af . We prove a Weyl type of estimate on the minimal number of sampling points to recover f stably in terms of the volume of its semiclassical wave front set. (Received September 12, 2019)