



DEPARTMENT OF MATHEMATICS

Colloquium

November 13, 2018

Refreshments will be served at 10:00 a.m. in 301 GP.

The presentation will begin at 11:00 a.m. in 302 Gordon Palmer Hall

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Topic: An alternative to Plancherel's criterion for bilinear operators

Abstract: : A well known criterion, based on Plancherel's identity, says that a convolution operator:

$$L_m(f)(x) = (f * K)(x) = \int \hat{f}(\xi) \hat{K}(\xi) e^{2\pi i x \cdot \xi} d\xi$$

is bounded from $L^2(\mathbb{R}^n)$ to itself if and only if the corresponding multiplier \hat{K} , i.e. the Fourier transform of the kernel K , is an L^∞ function. We obtain a similar characterization for bilinear translation-invariant operators of the form

$$T_m(f, g)(x) = \int \int \hat{f}(\xi) \hat{g}(\eta) m(\xi, \eta) e^{2\pi i x \cdot (\xi + \eta)} d\xi d\eta$$

that are bounded from $L^2(\mathbb{R}^n) \times L^2(\mathbb{R}^n)$ to $L^1(\mathbb{R}^n)$.

Our study encompasses only smooth multipliers m with bounded derivatives and the characterization we obtain is expressed in terms of the Lebesgue integrability of the multiplier m . This is joint work with Danqing He, Lenka Slavíková.