THE UNIVERSITY OF CHICAGO | THE COMMITTEE ON COMPUTATIONAL AND APPLIED MATHEMATICS

SPECIAL COLLOQUIUM

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Frame multipliers and their inversion

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Kent Chemical Laboratory, Room 107, 1020 E. 58th St.

ABSTRACT

Frames for Hilbert spaces generalize orthonormal bases. They allow redundancy and still guarantee perfect and stable reconstruction of every element of the Hilbert space. Nowadays, frames play fundamental role in many applied areas, for example in signal processing, image processing, data compression, and other. Given a frame for a Hilbert space H, the so called frame operator is associated and it is always invertible on H. Frame multipliers generalize frame operators. They are determined by three steps: 1) analysis via a given frame, resulting in a scalar sequence; 2) multiplication of the scalar sequence from step 1 with given weights; 3) synthesis via a second given frame, resulting in a modified signal. Such operators are important in signal processing, psychoacoustics, physics, and other areas. In this talk we focus on the question for inversion of frame multipliers. First we present sufficient conditions for invertibility on Hilbert spaces and formulas for the inverse operator (joint work with Peter Balazs). Then we consider the question whether the invertibility of a frame multiplier on a Hilbert space can be extended to hold on Banach and Fréchet spaces (joint work with Stevan Pilipović). At the end of the talk I will mention other directions of my research interests.

Organizers:
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