

Speaker: Fred Stoll (USC)

Title: Littlewood-Paley Theory for Subharmonic Functions on Domains in \mathbb{R}^N

Abstract: In the talk we will consider analogues of the classical Littlewood-Paley G - function and square function (or square area integral) S for subharmonic functions on domains in \mathbb{R}^N . These functions were introduced by J. E. Littlewood and R. E. A. C. Paley in 1936 for analytic functions in the unit disc in their study of Fourier series. These functions have also been studied by Elias Stein for harmonic functions in the upper half-space of \mathbb{R}^N

In the first lecture we will review some results of Lars Garding and Lars Hörmander concerning analogues of the classical Hardy H_p spaces for subharmonic functions on the unit ball in \mathbb{R}^N . These results concern the existence of harmonic majorants and boundary values for f^p ($p > 1$), where f is a non-negative subharmonic function on B . In the second talk we introduce the G -function and S -function for non-negative C^2 subharmonic functions and prove analogues of some of the well known classical inequalities between these functions, including L_p inequalities between S and the subharmonic function f . The development, with necessary modifications, is as in the text Trigonometric Series by A. Zygmund for analytic functions. Although our setting will be the unit ball of \mathbb{R}^N , the results can be extended to bounded domains with C^2 boundaries.

The lectures should be accessible to all graduate students who have taken, or are currently taking, real analysis.