ICMAT
INSTITUTO DE CIENCIAS MATEMÁTICAS

PhD
THESIS DEFENSE

SHARP ESTIMATES FOR LINEAR AND NONLINEAR WAVE EQUATIONS VIA THE PENROSE TRANSFORM

PHD STUDENT: Giuseppe Negro (ICMAT & Université Paris 13)

ADVISORS: Thomas Duyckaerts (Université Paris 13) & Keith Rogers (ICMAT)

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ABSTRACT: In 2006, Damiano Foschi found the sharp constant in the Strichartz estimate for the wave equation in three spatial dimensions and conjectured what the maximisers should be in other dimensions. First of all, I will present evidence to support his conjecture in odd dimensions while disproving it in even dimensions. Secondly, I will show how his three dimensional inequality can be sharpened further, adding a term which is zero on the maximisers. Finally, I will present an application of the sharpened inequality to the cubic wave equation with data in the critical-under-scaling L^2-Sobolev space. These results will take advantage of a conformal transformation which compactifies the space-time.

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