第１７６回 広島数理解析セミナー （２０１３年度）

Hiroshima Mathematical Analysis Seminar No.176

日時 ： **3月7日（金）１３：５０〜１７：３０**

場所 ： **広島大学理学部 Ｂ７０７**

今回は３件の講演です.

１３：５０〜１４：５０

講師 ： Wanderley Nunes do Nascimento 氏 （Federal University of São Carlos）

題目 ： L^p-L^q estimates for Klein-Gordon type wave models with non-effective time-dependent potential

要旨 ： We consider the Cauchy problem for Klein-Gordon type models,

$$u_{tt} - \Delta u + m(t)^2 u = 0, \quad u(0,x) = u_0(x), \quad u_t(0,x) = u_1(x), \tag{1}$$

with $tm(t) \to 0$ and $m \notin L^1$, i.e., $m(t)^2 u$ is non-effective time-dependent potential. The goal is to apply a diagonalization procedure to Klein-Gordon problems (1) with sufficiently smooth time-dependent coefficient $m = m(t)$ aiming to find a representation for the solution and then derive L^p-L^q decay estimates on the conjugate line.

A modified scattering result will complete our considerations.

The results presented in this talk is a generalization of L^2-L^2 estimates proved in the paper [1].

Bibliography

[1] Ebert, M. R., Kapp, R. A., Nascimento, W. N., Reissig, M., *Klein-Gordon type wave equation with non-effective time-dependent potential*, accepted for publication (2013).

１５：１０～１６：１０

講師　：　Emmanuel Chasseigne 氏 （University of Tours）

題目　：　A short survey on a class of nonlocal equations

要旨　：　In this talk I will present some basic facts about nonlocal equations involving Levy type terms. I will explain the pde and probability viewpoint and review some results that were obtained in the last 10 years concerning the integro-differential equations (existence, uniqueness, long-time behaviour, Dirichlet and Neuman problems etc.).

１６：３０～１７：３０

講師　：　Alan Champneys 氏 （Univeristy of Bristol）

題目　：　Localised pattern formation in higher-order nonlinear PDE

要旨　：　In this talk I will give a survey of results from the last 15 years on parabolic PDE systems on long domains (either in one or two spatial dimensions) which feature multiplicity of steady state solutions that represent patterned states that are localised to some portion of the domain. The key feature should be a sub-critical instability of the homogeneous background state that gives rise to bi-stability between the background and periodic domain-filling patterned states. This scenario is shown to occur naturally in PDEs with fourth-order spatial operators such as the Swift-Hohenberg equation with competing non-linear terms. The infinite multiplicity of localised patterned states occurs via a mechanism known as “homoclinic snaking” which can be analysed in one 1D using dynamical systems arguments, treating the infinite spatial domain as a time-like variable. Snaking is shown to arise naturally via the unfolding of a heteroclinic tangency between the background and patterned states. Applications occur in optics, convection, chemistry, structural biology and elastic buckling. To particular recent results are highlighted. The first is a new kind of snaking that occurs not due to a heteroclinic tangency, but due to a fold in the patterned state. The second is a new application to reaction diffusion systems with source and loss terms, in which the pattern-forming Turing bifurcation can be subcritical. It is argued that such a mechanism for biological pattern formation is more robust than the usual super-critical Turing mechanism.

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