第１８３回 広島数理解析セミナー （２０１４年度）

Hiroshima Mathematical Analysis Seminar No.183

日時 ： **１１月２８日（金）１５：００〜１７：３０**

場所 ： **広島大学理学部 Ｂ７０７**

今回は２件の講演です.

１５：００〜１６：００

講師 ： Gustavo Perla Menzala 氏 （National Laboratory of Scientific Computation）

題目 ： Recent progress on Mathematical models for Smart Materials

要旨 ： Smart Materials also known as adaptative systems have very special properties. Whenever an electric field acts on the material it creates stress. Conversely, when subjected to an internal elastic displacement reacts producing an electric charge. In other words, they are sensors and actuators. In this Lecture we intend to describe some of those linear models and study the long time behavior of the total energy associated with such phenomenon and further issues. This is recent joint work in collaboration with J. Sejje Suarez (Federal University of Rio Grande, Brasil).

参考文献

[1] R. C. Smith, *Smart material systems: Model development*, Frontiers in Applied Mathematics **32**, SIAM (2005).

[2] G. Perla Menzala and J. Sejje Suarez, Discrete and Continuous Dynamical Systems **33** (2013), 5273–5292. Journal of Mathematical Analysis and Applications **409** (2014), 56–73.

１６：３０〜１７：３０

講師　：　Michael Reissig 氏 （TU Bergakademie Freiberg）

題目　：　From $p_0(n)$ to $p_0(n+2)$

要旨　：　In this lecture we study the issue of global existence of small data solutions to the Cauchy problem for the semi-linear wave equation with a *scale-invariant* damping term, namely

$$v_{tt} - \triangle v + \frac{\mu}{1+t} v_t = |u|^p, \qquad v(0,x) = v_0(x), \quad v_t(0,x) = v_1(x),$$

where $p > 1$, $n \geq 2$ and $\mu > 0$. We will show by examples how the coefficient μ will influence the critical exponent. If $\mu = 0$, then the Strauss exponent $p_0(n)$ comes into play. If $\mu > 0$ is very large, then the Fujita exponent $1 + \frac{2}{n}$ appears as the critical exponent $p_\mu(n)$. But, what happens for small μ? This seems to be a delicate question. By choosing $\mu = 2$ we prove blow-up in finite time in the subcritical range $p \in (1, p_2(n)]$ and an existence result for $p > p_2(n)$, $n = 2, 3$. In this way we find the critical exponent for small data solutions to this problem. All these consideration lead to the conjecture $p_2(n) = p_0(n+2)$ for $n \geq 2$.

These are joint considerations with Marcello D'Abbicco (Bari, post-doc at University of Sao Paulo) and Sandra Lucente (Bari).

広島数理解析セミナー幹事

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