國立中山大學應用數學系
學術演講

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講　題：Prufer Transformation

時　間：2015/10/20（星期二）16:10 ~ 17:00 pm

地　點：理學院四樓理 SC 4013 室

茶　會：15:40 於理 SC 4010 室 (系辦公室)

摘要

The Prufer angle function is a well established and versatile tool for 'definite' Sturm-Liouville differential equations with separating boundary conditions, e.g., of Dirichlet or Neumann type. Prufer's method not only simplifies previous approaches, but also provides a unified approach to many Sturmian-type properties. For example, it yields basic eigenvalue existence and eigenfunction oscillation results, and also additional ones such as interlacing of eigenvalues and eigenfunction zeros, and various comparison principles.

In this talk an extension involving two functions will be explored. It applies to coupling (i.e., non-separating) boundary conditions, e.g., of periodic or antiperiodic type. We remark that such boundary conditions appear in the study of planetary motion, wave motion, separation of variables in classical boundary value problems, etc. The method again simplifies and unifies previous approaches to such problems.

It also applies (for all the above boundary conditions) to a 'semidefinite' relaxation of the Sturm-Liouville equation introduced by Atkinson. Although simple in appearance, this has subtle consequences. For example, it includes certain differential equations containing measures and difference equations. The oscillation results can be quite different, and one even has to redefine what eigenfunction oscillation means.

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