Colloquium

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108年04月10日(三) 14:30 應用數學系多媒體教室 (408)

Title and abstract:

Sign patterns requiring a unique inertia

A sign pattern $\mathcal{P}$ is a matrix whose entries are in $\{+, -, 0\}$. The quantitative class $Q(\mathcal{P})$ of $\mathcal{P}$ collects all the real matrix such that the signs of its entries agree with the corresponding entries in $\mathcal{P}$. The study of sign patterns arises from dynamical systems in mathematical biology. Oftenly, the coefficients in a model have given signs but not given values, so the linearization at its equilibrium leads to a sign pattern. The inertia (n_+, n_-, n_0) of a matrix records the number of its eigenvalues whose real part is positive, negative, and zero, respectively. Given the linearization of an equilibrium, its inertia describes the local behavior. In this talk, we will introduce some sign patterns $\mathcal{P}$ such that every matrix in $Q(\mathcal{P})$ has the same inertia.

Research interests: Graph Theory and Matrix Theory, Combinatorics, Inverse Eigenvalue Problem, Minimum Rank Problem, and Spectral Graph Theory

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