
MINERVA CATRAL, Xavier University

Spectral properties of a structured matrix related to a system of second order ODEs

We consider real matrices of the form $C = \begin{bmatrix} A & B \\ I & O \end{bmatrix}$ where A, B are square matrices and I, O are the identity matrix and zero matrix, respectively. Such matrices arise from dynamical systems of second-order ordinary differential equations $\ddot{\mathbf{x}} = A\dot{\mathbf{x}} + B\mathbf{x}$ where A and B are real matrices of order n . Eigenvalue properties are studied for the sign pattern $\mathcal{C} = \begin{bmatrix} \mathcal{A} & \mathcal{B} \\ \mathcal{D} & O \end{bmatrix}$ of order $2n$, where \mathcal{A}, \mathcal{B} are the sign patterns of A, B respectively, and \mathcal{D} is a positive diagonal sign pattern. This talk gives an overview of results from joint works with Adam Berliner, D.D. Olesky and P. van den Driessche.