

An Input-Output property of non-negative matrices with tree structure

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A new Input-Output property for dynamical systems is defined which allows to analyze the convergence of positive feedback interconnections for general nonlinear dynamical system. It is shown in particular that linear maps defined in terms of non-negative matrices whose underlying incidence matrix has the structure of a tree satisfy the above property. As an example of application, this allows to study global convergence of neural networks with tree structure.