1 Euclidean Jordan algebras and inequalities on the parameters and on the spectra of a strongly regular graph

By *Luis Vieira.*

Let τ be a strongly $(n, p; a, c)$ regular graph, such that $0 < c < p < n - 1$, A his matrix of adjacency and let $\mathcal{V}_n$ be the Euclidean real space spanned by the powers of A^j, $j \in \mathbb{N}_0$ where the scalar product $\bullet | \bullet$ is defined by $x|y = \text{trace}(x \cdot y)$. In this work ones proves that $\mathcal{V}_n$ is an Euclidean Jordan algebra of rank 3 when one introduces in $\mathcal{V}_n$ the usual product of matrices. Working inside the Euclidean Jordan algebra $\mathcal{V}_n$ with the the only complete system of orthogonal idempotents associated to A one defines the generalized krein parameters of the strongly $(n, p; a, c)$ regular graph τ. Finally one presents necessary conditions over the parameters and the spectra of the τ strongly $(n, p; a, c)$ regular graph.