ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

13. Combinatorics

1991 MS Classification: 05C12,05C75,31C20
Carmona, Angeles; Bendito, Enrique; Encinas, Andrés-Marcos, Universitat Politècnica de Catalunya, Spain

On the Shortest Paths in a Distance Regular Graph

We aim here at introducing a new point of view of the Laplacian of a graph, Γ. With this purpose, and in the context of the Potential Theory, we consider $\mathcal{L}$ as a kernel on the finite space $V(\Gamma)$. Then, we prove that $\mathcal{L}$ is a nice kernel, since it verifies some fundamental Principles as Frostman's maximum principle and energy and equilibrium principles on any proper subset of $V(\Gamma)$. If we consider Γ as a proper set of a suitable host graph, the number of different components of the equilibrium measure offers a bound on the distance between vertices. In particular, we obtain the structure of the shortest paths of a distance-regular graph. As a consequence, we find the intersection array in terms of the equilibrium measure.