

[Tomiyama, Masato](#)

**On the primitive idempotents of distance-regular graphs.** (English) [Zbl 0993.05148](#)  
*Discrete Math.* 240, No. 1-3, 281-294 (2001).

From the author's abstract: Let  $\Gamma$  denote a distance-regular graph with diameter  $d \geq 3$ . Let  $E, F$  denote nontrivial primitive idempotents of  $\Gamma$  such that  $F$  corresponds to the second largest or least eigenvalue. We investigate the situation that there exists a primitive idempotent  $H$  of  $\Gamma$  such that  $E \circ F$  is a linear combination of  $F$  and  $H$ . Our main purpose is to obtain inequalities involving the cosines of  $E$ , and to show that equality is closely related to  $\Gamma$  being  $Q$ -polynomial with respect to  $E$ . This generalizes a result of Lang on bipartite graphs and a result of Pascasio on tight graphs.

Reviewer: [R.E.L.Aldred \(Dunedin\)](#)

**MSC:**

- [05E30](#) Association schemes, strongly regular graphs
- [05C12](#) Distance in graphs
- [05C50](#) Graphs and linear algebra (matrices, eigenvalues, etc.)

Cited in **6** Documents

**Keywords:**

distance-regular graph; primitive idempotents; eigenvalue; cosines;  $Q$ -polynomial

**Full Text:** [DOI](#)