962-05-621 **Mark S. MacLean*** (maclean@math.wisc.edu), Mathematics Department, University of Wisconsin, 480 Lincoln Drive, Madison, WI 53706. *Bipartite distance-regular graphs and their primitive idempotents.*

Let Γ denote a bipartite distance-regular graph with diameter $D \geq 4$ and valency $k \geq 3$. Let M denote the Bose-Mesner algebra of Γ, and let E, F denote primitive idempotents of M. We say the pair E, F is *taut* whenever *(i)* the ranks of E, F are not 1, and *(ii)* the entry-wise product $E \circ F$ is a linear combination of two distinct primitive idempotents of M. We show the pair E, F is taut if and only if there exist real scalars α, β such that

$$\sigma_{i+1}\rho_{i+1} - \sigma_{i-1}\rho_{i-1} = \alpha\sigma_i(\rho_{i+1} - \rho_{i-1}) + \beta\rho_i(\sigma_{i+1} - \sigma_{i-1}) \qquad (1 \leq i \leq D-1),$$

where $\sigma_0, \sigma_1, \ldots, \sigma_D$ and $\rho_0, \rho_1, \ldots, \rho_D$ denote the cosine sequences of E, F, respectively. We define Γ to be *taut* whenever Γ has at least one taut pair of primitive idempotents but Γ is not 2-homogeneous in the sense of Nomura. Assume Γ is taut and D is odd. We obtain all intersection numbers of Γ in terms of just four parameters. We also show that if Γ is taut and D is odd, then Γ is an antipodal 2-cover. (Received September 16, 2000)