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**Mark MacLean\*** (macleanm@seattleu.edu), Seattle University, Math Department, Seattle, WA 98122, and **Paul Terwilliger**. *An  $A$ -invariant subspace for taut distance-regular graphs*. Preliminary report.

Let  $\Gamma$  denote a taut bipartite distance-regular graph with vertex set  $X$ , diameter  $D \geq 4$ , valency  $k \geq 3$ , and adjacency matrix  $A$ . We find a subspace  $W$  of  $\mathbb{R}^X$  that is invariant under multiplication by  $A$ . The  $A$ -invariance of this particular subspace ties together an algebraically defined object (the taut distance-regular graph) and a combinatorial condition. Furthermore, our results demonstrate similarities between the taut distance-regular graphs and the well-studied 2-homogeneous distance-regular graphs. (Received September 14, 2010)