1050-05-102 **Aleksandar Jurisic*** (aj@fri.uni-lj.si), Faculty of Computer and Information Science, LKRV, Jadranska 21, 1000 Ljubljana, Slovenia, and **Paul Terwilliger** (terwilli@math.wisc.edu), Department of Mathematics, Van Vleck Hall, University of Wisconsin-Madison, 480 Lincoln Drive, Madison, WI 53706. *Distance-regular graphs with tails.* Preliminary report.

Let Γ be a distance-regular graph with valency $k \geq 3$ and diameter $d \geq 2$. It is well-known that the Schur product $E \circ F$ of any two minimal idempotents of Γ is a linear combination of minimal idempotents of Γ. Situations where there is a small number of minimal idempotents in the above linear combination can be very interesting. In the case when $E = F$, the rank one minimal idempotent E_0 is always present in this linear combination and can be the only one only if $E = E_0$ or $E = E_d$ and Γ is bipartite. We study the case when $E \circ E \in \mathrm{span}\{E_0, E, H\}$ for some minimal idempotent H of Γ. We call a minimal idempotent E with this property a *tail*. If Γ is Q-polynomial wrt E, then E is a tail. Let θ be an eigenvalue of Γ with multiplicity $m > 1$. We show that

$$m(a_1 - k - k\,\omega)\left(\omega - \frac{k\,\omega^2 - a_1\,\omega - 1}{k - a_1 - 1}\right) \;\leq\; k(a_1^* - m - m\,\omega)\left(\omega - \frac{m\,\omega^2 - a_1^*\,\omega - 1}{m - a_1^* - 1}\right),$$

where $\omega = \theta/k$ and $a_1^* = q_{ii}^i$ if $\theta = \theta_i$. Let E be the minimal idempotent corresponding to θ. The equality case is equivalent to E being a tail. Further characterizations of the case when E is a tail are given. (Received February 28, 2009)