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Mikhail H. Klin* (klin@cs.bgu.ac.il), Department of Mathematics, Ben-Gurion University of the Negev, POB 653, 84105 Beer Sheva, Israel, and **Matan Ziv-Av**. *Investigation of some association schemes on 40 points*. Preliminary report.

We describe a family of association schemes on 40 points sharing the same tensor of structure constants. The question about the existence of such scheme was posed by D.G.Higman, first example provided by Y.Chang and T.Huang. One of the basis graphs of the initial scheme M is the point graph of the generalized quadrangle $Q(4, 3)$, $Aut(M)$ is a transitive group of order 1920. We discovered a new partial linear space on 40 points with 40 lines of size 4 which is in a sense a geometrical generator for M . Using a computer and the catalogue of strongly regular graphs on 40 points by T.Spence, we proved that there exists precisely 15 association schemes, algebraically isomorphic to M . Four of the discovered schemes, including M , are geometric in the above sense. We also consider an association scheme which appears as coherent closure of an exceptional graph of valency 6 on 40 points, which was discovered by R.Anstee in 1981. The group of this scheme and some of properties of basis graphs are investigated. Finally, we mention one more interesting scheme on 40 points, which was recently characterized by K.Abdukhalikov and E.Bannai et al. This scheme is related to the generalized quadrangle $W(3)$. This is a joint project with Matan Ziv-Av. (Received January 22, 2007)